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GARDENING IN CALIFORNIA

LANDSCAPE AND FLOWER

JOHN McLAREN

Mrs. C. B Brook

As the bee
takes nectar from your flowers;

So may you too
glean thoughts from these leaves.

from

Sloyd and Verna
'29

Gardening in California Landscape and Flower

BY

JOHN McLAREN
SUPERINTENDENT OF GOLDEN GATE PARK
SAN FRANCISCO. CALIFORNIA

WITH ILLUSTRATIONS AND PLANTING PLANS

SAN FRANCISCO
A. M. ROBERTSON
MCMXXIV

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The Bruce Brough Press
SAN FRANCISCO, CAL.

PREFACE

THIS handbook is respectfully submitted to gardeners in California, amateur and professional, as supplementary to, and a modification of those excellent treatises and encyclopedias on Landscape and Flower Gardening which have become the authorities and text-books on the subject, but which were written for the conditions of climate and season in European countries and the Eastern States of our own land.

In California these conditions are so different, and the possibilities of the culture and development of trees, shrubs and flowers are so much greater than in Europe or in any other of the United States of America, that our gardeners have had to do a great deal of original investigation and experimental work. The results of such investigation and work by the writer are recorded in these pages.

The difference referred to is well illustrated by the universally loved Pansy which, in the Eastern States, is sown in February, flowering in May or June, while in California it is sown in July and flowers from November to May, and also by the Acacia which, in the East, is grown in pots in the conservatory, protected by glass and heated by artificial heat, whereas, in our State, it grows a handsome tree, in any soil in the open air and flowers in midwinter.

Although it has been found necessary to treat of the conservatory to a certain extent, yet this has been done only as subsidiary to the main purpose of the book, the treatment, in the conservatory, of plants which are not hardy in the open air locally, being the same as in any other part of the country. It should, however, be kept in view that hundreds of trees, shrubs and flowers, which cannot possibly exist in the open air in those parts of the United States and Europe where the climatic conditions are more harsh than here, flourish and give grand effects out of doors in California.

During his gardening experience of thirty-five years in various parts of California, but particularly during the past twenty years of his superintendency of Golden Gate Park, San Francisco, the author has had, from all over the State, a great number of inquiries and requests for advice and suggestion.

These inquiries have become so numerous that it has been practically impossible for him to answer them all, and such replies as he has been able to give have necessarily been very brief. He therefore believes that his experience, as now embodied in this book, will be of interest

and perhaps value to those who take delight in the wonderful results with which the fertile soil and genial climate of our State reward their earnest and loving labor.

It is believed that the practical value of the work is added to by the illustrations which are all from photographs especial y taken for this purpose.

In writing the book the author has had the able collaboration and assistance of his friend Mr. James C. Fyfe of San Francisco, of which, in this place he desires to record his deep and grateful appreciation.

That this book may give pleasure and be of use to all who strive to make our State even more attractive by adding to the beauties of its landscape and gardens, is the earnest hope of

THE AUTHOR

San Francisco, December, 1908.

THE PUBLISHER'S NOTE TO THE THIRD EDITION

The First Edition of this work having been quickly exhausted and the demand for the Second Edition also having far exceeded the expectations of the publisher, this Third Edition is now submitted in view of the ever increasing demand for the book. The opportunity has been taken to thoroughly revise the work and to make a number of additions from the ripe experience of the Author.

San Francisco, November, 1924.

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GARDENING IN CALIFORNIA

LANDSCAPE AND FLOWER

GARDENING IN CALIFORNIA

CHAPTER I

THE LOCATION OF A SITE FOR HOUSE AND GARDEN, AND THE PRELIMINARY PLANS

AS THE location and laying out of the grounds which he has to cultivate are important factors in the success of the gardener in California, as elsewhere, a few practical suggestions upon these points are deemed advisable and in keeping with the general plan of the book. Before the best selection can be made, one must have a general knowledge not only of the locality where he intends his home and garden to be, but also of its surroundings. Many important points should be taken into consideration—especially the aspect and the altitude—in deciding whether the top of a hill, or a hillside, or a flat, low, sheltered spot is to be preferred.

How much not only the locality but also the aspect (that is, whether facing the North, South, East or West) affects the culture of the garden can scarcely be appreciated by those who have not studied this very important subject. For example, few may realize the difference, in the one point of shelter, between a garden laid out facing the North and one facing the South, or (particularly in San Francisco where the prevailing wind in the Summer season is from the West) between a garden facing the East and one laid out so as to face the West.

In choosing a site for a dwelling-house and garden, an aspect facing the South or South-east should be preferred, as it will be better sheltered from the prevailing winds and have a much warmer temperature than one facing the West or North. Land facing the South will have earlier flowers and may be more comfortably visited and enjoyed at all

seasons, as the ground and walks will dry more quickly after watering or after rains than they would if facing the North.

Another exceedingly important point to be kept in view is that water—and water in abundance—must be provided for a garden, for unless there is an ample supply during our long Summer, gardening in general cannot be successful. Therefore it is necessary, before selecting a site for the garden, to see that water may be had in generous quantities and at all times, either from wells, by pipe from a reservoir, or by ditch from a stream. In the neighborhood of cities and large towns it may be procured from public works, and, of course, within the cities water can be had in any reasonable quantity desired, but in the country or where there are no public pipes in the vicinity, wells will have to be bored or dug, or a supply procured by the other means suggested.

After the site is selected, the next study should be the preliminary plan for the improvement of the ground, the first and most important point to be decided being upon what part of the site the dwelling-house shall be built. This requires long and careful study, for the ground must be visited frequently and at different times of the day, in stormy weather as well as when the days are warm and sunny. Consideration must be given to the views that may be enjoyed from the windows of the different rooms, and, in connection with this, it is necessary to anticipate the possible use to which the adjoining properties may be put, especially as to whether there is a likelihood of buildings being erected so as to interfere with or be a blot upon expected views. Then if there are any objectionable features on neighboring properties, this is the time when the plans should be prepared so that, in the arrangement of the building and planting of the grounds, these objectionable points may be shut off from view as much as possible.

When the part of the grounds upon which the house is to be built has been determined, it should be staked off with strong stakes (say four-inch by four-inch pine), driven in

Gateway Shaded by Trees.

three feet and standing five feet above the ground, so that the four corners of the proposed house may be seen from some distance, and that thus the effect of the building may be studied from the street, or, if the grounds are of large extent, from different points along the lines of the projected drive or walks leading to the building. Where very large grounds are to be laid out, flags set on tall poles will be necessary to properly define the outlines when the effect is viewed from a distance, and, at this time also, the sites for stables and any other necessary outbuildings should be staked off in similar way. It is hardly necessary to say that such buildings as the stables must be placed at the rear of the house.

The house must, of course, be connected, by either a walk or driveway or both, with the street or public road, and an entrance gateway provided at the most convenient and effective part of the frontage, so the next step to take is to determine where the main gateway shall be located. This, if possible, should be at a point where the street or public road is on the same level.

After the spot for the gateway is located, the approach to the house should be staked off by a center line of stakes. The principal roadway should be carefully studied from every viewpoint, that is, from the house site, from the gateway and from other points where the effect will be seen, no pains being spared to insure this being planned out in the best possible manner and along the best possible line. When the grounds are of considerable extent, it should also be made sure that a glimpse of the house will be had from one or two points along the road. The side lines for the principal roadway should then be staked off, these, if a driveway, being at least sixteen feet apart, or, if a foot-path, not less than eight feet. The stakes should be at least one and one-quarter inch square by about three feet in length, and driven one foot deep, leaving two feet above the ground to mark the lines of the proposed drive or walk.

After the principal approach to the house-site has been decided upon and staked out, the necessary walks and roads connecting the house-site with the site of the garage and other outbuildings must be marked and staked in similar way as for the main approach. It is strongly urged that care should be taken to have these walks in reasonably direct lines, for unless they are direct, they will not be followed, and those who are compelled to go to the outbuildings many times a day will be sure to make short cuts, trampling down grass and perhaps fine shrubbery, such foot-paths and trails always giving an uncared-for effect and being blemishes in any property.

Before beginning the planting of the trees and shrubs for sheltering and ornamenting the grounds (this subject being fully considered in other chapters), the grounds should be carefully surveyed and platted, the house-site, the sites of the outbuildings, the approach and roads of all kinds being marked on the plat.

When the grades and positions of the different buildings have been established and marked, and the approach and other roads staked off, all the building-sites should be roughly graded, and the fills, if any, on the roadways and walks leveled up.

But first, before beginning this rough grading, careful provision must be made for saving all of the good top-soil which may be found on the sites of the buildings, the roads and the walks. The importance of this will be realized when the work of planting the ground is taken up and when this good top-soil will be of the greatest value. How often do we find that this exceedingly valuable natural soil has been carelessly used for making fills or road-beds and embankments, instead of having been saved for improving the many pieces of poor soil for which this natural top-soil would have been the covering. Every yard of such good soil saved from grading operations can be used at some point of the grounds where trees, shrubs and plants are to be set out.

After the survey of the grounds has been platted (as suggested above, the sites of the main building and outhouses as well as the lines of the roads and walks being marked on that plat), the next important work will be preparing the plan of planting, and this, in its turn, will require the most careful consideration.

If the grounds, which are to be planted, are exposed, strong-growing hardy trees which will stand the harsh, drying winds will have to be selected for the outer planting or sheltering groups, reliance being placed upon these hardy, sturdy, vigorous growers to give shade and shelter to those tender but more ornamental kinds which cannot stand so much exposure.

Should the site be well sheltered naturally by trees or by neighboring hills, or should it be in a flat open country, it will not be necessary to plant the common, hardy trees in such large numbers for that purpose.

Outline of Lawn and Grouping of Trees.

In preparing the plan of planting, care should be taken to connect the different groups under one general plan, and not to gather the trees and shrubs in spots or in stiff, formal lines at equal distances apart. Perhaps the best place from which to study the plan (of planting and grouping the trees and shrubs) is from the house-site, the effect being judged from the points on the house-site where the principal windows and doors and verandas will be. When the grounds are large enough, the main lawns or grass plots will, of course, be located immediately about the house, and the groups of trees with their undergrowth of shrubs can be massed round and about the lawns, these forming the outlines for the grassy surface. These outlines should be made as informal as the nature and size of the grounds will permit. Bold points of trees and shrubbery should project into the lawn space, and again the grassy surface should be allowed to run deep into, as if getting lost among, the tree groups, the plan always avoiding anything formal either in the shape of the grassy inlets or of the shrubbery groups.

In this connection it is suggested that some consideration be given to what may be termed the happy accidents of Nature's planting, for in some of the untouched virgin spots in Nature's garden there are scenes more soft and more beautiful than anything our gardening has yet produced. Those who have undertaken to do what we are now considering—that is, to plant a pleasure-garden and lawns—and are in doubt as to how to establish the lines of the lawns or the groups of trees, shrubs and flowers, may get invaluable suggestions for the arranging of them in harmonious composition if they will, as our greatest painters do, go into the natural forests of our hills and hillsides, or the meadows and haughs of our valleys, and select, from the innumerable beautiful scenes, the one whose beauty most appeals to them and which seems to best fit the general outline of the site for which the plans are being prepared. Then let the measurements of this part of Nature's garden be carefully

Grounds decorated with Palms. Cocos plumosa as Sidewalk Tree.

taken, figuring what are its length, and its breadth, what are the depth and width of the grassy bays which seem to meander through the forest, also the form and shape which these bays assume. It will be found that Nature seldom runs straight lines and shaped curves. Let the woody promontories be measured, figuring how far each one projects into the meadow and noting how Nature has done its planting—how far one tree is from the other and how harmonious the whole plan is.

After all of the trees with their names and characteristics have been sketched into a rough map, the different shrub-growths should next be similarly studied and sketched in, how they are distributed being specially noted. After these, and any other data which seem to be of importance in the general effect, are carefully platted, let this rough sketch be laid out to scale and reduced or enlarged to fit the plan for the propsed grounds. If the proportions of the original are faithfully carried out and imitated in the form and outlines of the lawns and in the character and planting of the trees and undergrowth the result will be a delight to the owner and an artistically laid out property.

There are numerous instances of such spots in our redwood forests and in the Sierras. Some of the sweetest landscapes are to be found in these mountain meadows, and they always afford the greatest delight to the eye of taste when they are unexpectedly discovered, enriched, as they are, with beds and tufts of wildflowers, grasses and ferns.

The form and outlines of the different groups of shelter-belts being platted, what to plant in each and what character of picture to aim for are treated in detail in Chapter II. When preparing the plan of planting, it should be considered of the utmost importance to break and soften the hard lines of groups by planting single trees apart from the main bodies in the groups.

CHAPTER II

PLANNING THE PLEASURE-GARDEN AND GROUNDS

THE subject of this chapter is one which should receive very careful consideration before the work is actually begun, and a detailed PLAN of planting should be sketched out, especially keeping in view what the effect of the trees, shrubs and plants will be when they reach maturity. What that plan of planting actually may be depends very greatly upon how the ground is located.

If the site selected is on a hill, the character of the planting will be entirely different from that of a location on a level plain, where the situation is more likely to be well sheltered and favored with a deep, rich soil.

In this, as in every work we undertake, the first thing to be considered is the end in view, and the next the best means of attaining that end. As, in the planting of a Pleasure-Garden and Grounds, the end to be attained is how the trees and plants shall be most effectively placed (both that they themselves shall appear to the best advantage and also that each tree and each group of plants and shrubs shall contribute its full proportion to the effective laying out of the property as a whole), in order to attain that end, it is necessary to take advantage of every point in the natural formation of the location.

As has just been stated, the character of the planting on a hillside site is very different from that on a site located in a sheltered valley. On a hillside site the ground is seldom of an even nature, there frequently being projecting points of land or rocky outcroppings showing through the surface. These projecting points should be ornamented with hardy, strong-growing trees such as the Pine, Eucalyptus, Acacia, Cypress, Redberry and others of this class. No shrub, either exotic

or indigenous, is so well adapted to the planting of a rocky ridge or in the foreground of hillside groups as our native Holly (Heteromeles arbutifolia). Another native which groups well in any such situation is our evergreen shrub Oak. Like the Redberry, its leaf has a good color, it has a semi-drooping habit of growth, it is evergreen and grows on dry banks on any exposure either North, South, East or West, excepting within a mile from the ocean, where, if facing the West and much exposed, it is apt to get wind-blown and generally does not thrive so well.

Where a shrubbery effect is desired and the soil is rich, some other shrub must be substituted, as the effect of a good soil will be to force the Oak into tree shape and to grow too large for a shrub effect, but where the soil is of a loose, rocky nature, and not too rich, the evergreen native shrub Oak gives one of the best effects possible without cultivation or irrigation.

These hardier trees are recommended also for planting on the outer lines of grounds of the extent of about one acre or over, or on those portions of a Pleasure-Garden which are much exposed or beyond the reach of the hose, and, as already suggested, they can be planted at any parts where the soil is poor.

For the planting of groups or clumps to be located immediately about the lawns or near hydrants where they can be watered, a much larger variety of trees and shrubs may be drawn from, the Bamboo, the Birch, the Maple, the Hawthorn, the Lilac, the Laurel and many others giving character and completeness to the composition.

Where the grounds are as large as from three to four acres, separate groups of each genus should be planted. For instance, exceedingly effective groups can be formed by planting a mass consisting of three or four varieties of Pines; another of Eucalyptus in variety; another of Spruce and Fir; another of a variety of evergreen Oaks; another of our native Laurel; another of Redwood; another of Cedar, and so on;

and again, these may be planted so as to form combinations. Such trees as the Maple and Sycamore, or Cedar (Thuya) and Coast Redwood combine beautifully, but it must be particularly kept in view that grouping round-headed trees with those which are of pyramidal habit is a mistake. Round-headed trees must be grouped with those of the same habit, and pyramidal trees with those of similar form, the effect always being pleasing, but mixing those two shapes in the same group mars the effect and ruins the composition.

Evergreens and deciduous trees harmonize very well in a group, provided they are of the same shape and outline. For instance, a group formed by combining the Bamboo with the Birch is most pleasing, both of these being of the same graceful semi-pendulous habit.

It should, then, be remembered, in massing groups of trees for planting, that form and habit should be studied much more closely than any other quality.

In planning the groups it may be found desirable and effective to form some entirely of evergreens, others entirely of deciduous trees and shrubs, and others of a mixture of both, a very good combination being a group of our native Laurel and the European Linden, because both are of the same graceful habit of growth.

The same rule applies to the planting of shrubbery masses; the stiff and the formal should never be associated with the rounded, free-spreading kinds—that is, the kinds whose limbs spread wide and rest gracefully on the surface of the lawn.

In the disposition of a number of sorts of trees and shrubs in the landscape, the same principle must be followed in producing variety and harmony. If they are mixed together in a haphazard way, the results will very rarely be pleasing, but, at the same time, monotony must be guarded against. For example, groups of Oaks should not be followed by groups of round-headed trees, but rather by a mass formed of such trees as the California Laurel, while next to the

Eucalyptus viminalis makes a stately and impressive avenue or highway tree.

Laurel might come the Poplar or some other tree of similar column-shaped head and symmetry. Then again, when groups meet, they might sometimes be blended together. For example, a group of Oaks, adjoining a group of California Laurels, might be blended into the Laurel group, by the Oaks being planted so as to overlap the Laurels and the Laurels the Oaks, as is to be found in natural groups.

The same rule applies to shrubs and even to flowers at the extreme points of the groups.

When a group of Pines adjoins a group of Live Oaks, it is always desirable to blend the two groups at the junction of the one with the other, care being taken to avoid regular progression and everything like formality, and it being borne in mind that grounds laid out according to simple plans are generally much more pleasing than those laid out on over-pretentious lines.

After the walks and drives are laid out (this subject being fully treated in Chapter IV) the next important work should be the mapping of the water-pipe system.

For a garden of about four acres in extent, a two-inch main will be necessary. This main should be laid along the middle of the ground with one and one-half inch branches laid at right angles from the main, about one hundred feet apart from each other (the first branch from the main to be laid fifty feet from the fence line), and with stand-pipes and connections to fit the hydrants also one hundred feet apart, so that any part of the garden may be reached with a single fifty-foot length of hose.

How often do we see both amateur and professional gardeners struggling to reach some favorite which unfortunately has been planted just out of reach of the last length of hose! It should always be borne in mind that water-pipe, even of the best quality, is much cheaper than hose, also that iron pipe lasts in the ground at least twenty years, whereas the life of the average rubber hose never exceeds two years, and very often is not more than one year.

Where a good pressure may be had from public water-works and when the supply is steady and reliable, it may not be necessary to construct a water-tank, but, where pumping has to be resorted to, or the public supply is liable to be shut off at times, it is well to have a water-tank erected. The tank should be of generous dimensions, and should be placed at least sixty feet above the level of the grounds to be irrigated. Of course, a lower tower would give some pressure, but the higher the source of the water supply and the nearer it is placed to the point of distribution the better the results and the shorter the time required to water or sprinkle the grounds, so, on the score of economy as well as efficiency, the tank should be placed at least sixty feet in height.

It has been deemed advisable to introduce a few planting plans, suitable for lots and gardens of various sizes, not necessarily to be rigidly adhered to in every particular, but to be used as suggestions.

Many additional species, or their varieties, may be substituted for or added to the suggestions, care being taken however that the principal plantings shall be of such species as are known to succeed and do well in the locality. It should be borne in mind that many species flourish in warm sunny portions of the State while others give best results in the cool atmosphere of the coast regions; for instance, as stated in the text, the Oleander is not recommended for the cool climate of San Francisco while the Fuchsia attains in that vicinity its most perfect growth.

PLANTING PLANS

PLANTING LIST

For Lot 25′ x 120′.

Group No.

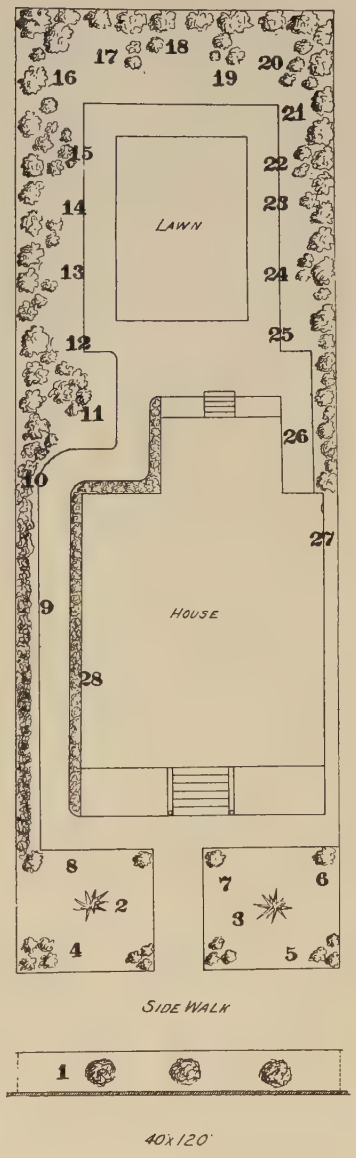
1. Acacia melanoxylon.
2. Veronica decussata.
3. Choisya ternata.
4. Roses.
5. Buxus sempervirens.
6. Viburnum Tinus.
7. Clianthus puniceus.
8. Lilac.
9. Climbing Rose.
10. Escallonia.
11. Diervilla.
12. Coprosma Baueri and Spanish Broom.
13. Cupressus lawsoniana.
14. Cratægus Oxyacantha flore-pheno-rubro.
15. Deutzia.
16. Myrtle.
17. Euonymus.
18. Pittosporum.
19. Ligustrum japonicum.
20. Erica mediterranea.
21. Climbing Roses.

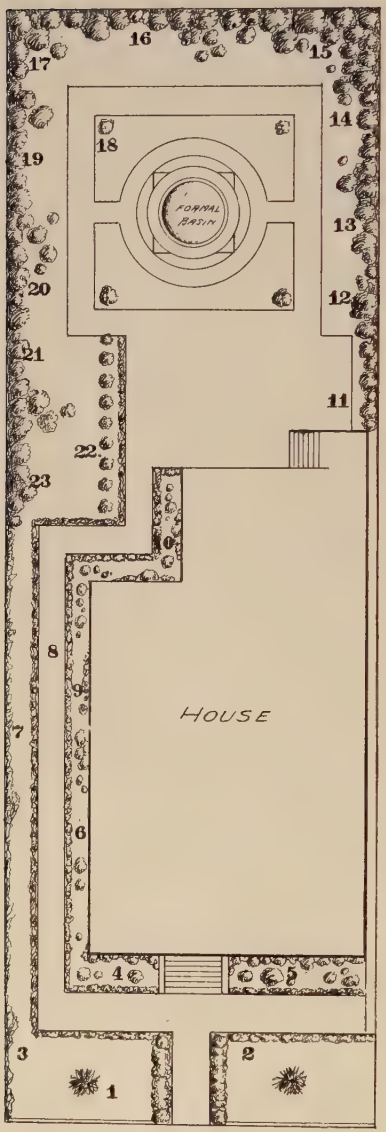
PLANTING LIST

For Lot 40′ x 120′.

Group
No.

1. Sugar Maple or Sterculia.
2. Phœnix reclinata or Brahea Sonoræ.
3. Myrtle.
4. Pittosporum Tobira.
5. Euonymus japonicus aureus.
6. Escallonia rubra.
7. Choisya ternata.
8. Veronica decussata.
9. Climbing Roses and Geraniums.
10. Magnolia grandiflora and Perennial Phlox.
11. Coprosma Baueri and Violets.
12. Cestrum aurantiacum.
13. Cerasus Laurocerasus.
14. Roses.
15. Arbutus Unedo.
16. Lilac.
17. Acacia mollis.
18. Leptospermum lævigatum.
19. Philadelphus.
20. Acacia dealbata.
21. Spiræa (bridal wreath).
22. Aucuba japonica.
23. Roses.
24. Callistemon.
25. Spartium junceum.
26. Fuchsia.
27. Plumbago.
28. Flower Border.





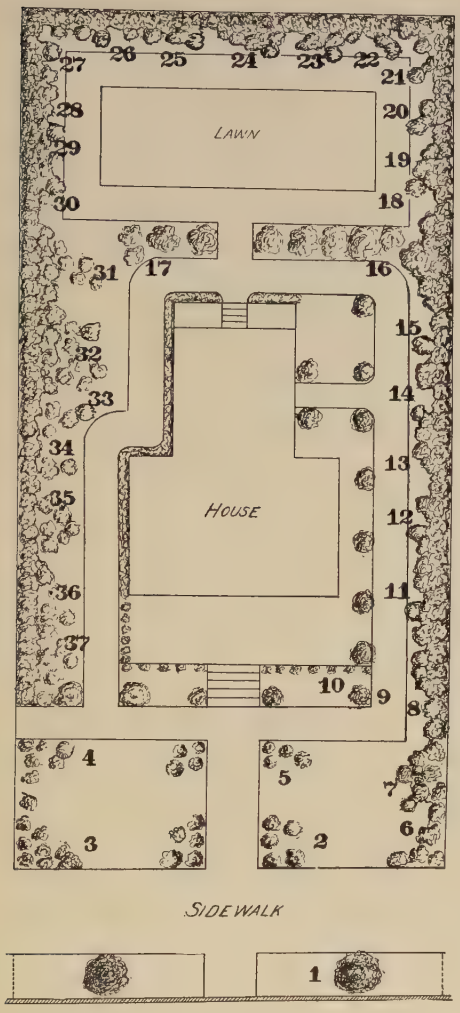
50′ x 150′

PLANTING LIST

For Lot 50′ x 150′.

Group No.

1. Phœnix canariensis.
2. Border of Violets or Ivy or Creeping Juniper.
3. Climbing Roses, Honeysuckle, Clematis, etc.
4. Choisya ternata.
5. Veronica decussata.
6. Aralia Sieboldiana.
7. Bougainvillea.
8. Walk.
9. Aucuba.
10. Viburnum Tinus grandiflorum.
11. Pittosporum.
12. Grevillea robusta.
13. Euonymus and Pyrus japonica.
14. Acacia cultriformis and Lilac.
15. Acacia mollis.
16. Escallonia rosea and Philadelphus.
17. Acacia dealbata and Spiræa.
18. Thuya gigantea.
19. Leptospermum lævigatum and Diervilla.
20. Bamboo.
21. Coprosma Baueri.
22. Boxwood.
23. Aucuba japonica.



PLANTING LIST

For Lot 75′ x 150′.

Group No.

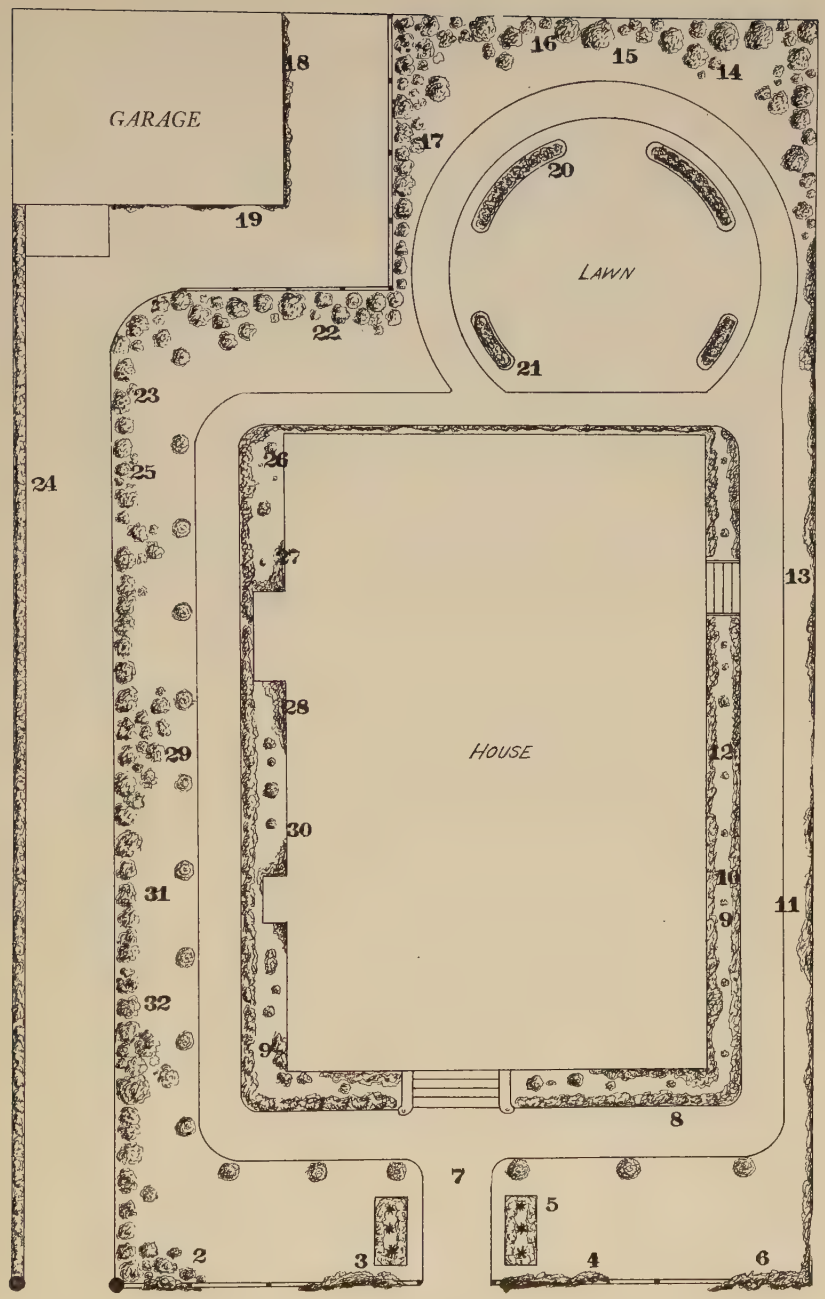
1. Huntingdon Elm.
2. Retinospora obtusa.
3. Pittosporum eugenioides.
4. Escallonia rosea.
5. Choisya ternata.
6. Euonymus japonicus aureus.
7. Coprosma Baueri.
8. Bamboo.
9. Buxus sempervirens.
10. Wistaria.
11. Aucuba sempervirens.
12. Roses.
13. Viburnum Tinus.
14. Roses.
15. Acacia armata.
16. Grevillea robusta.
17. Cerasus Laurocerasus.
18. Cerasus Laurocerasus.
19. Lilac.
20. Cupressus lawsoniana.
21. Philadelphus.
22. Poplar.
23. Acacia latifolia.
24. Hawthorn and Diervilla.
25. Birch and Leptospermum.
26. Linden and Acacia fragrans.
27. Corynocarpus.
28. Ligustrum and Broom.
29. Cestrum.
30. Portugal Laurel.
31. Roses and Eugenia latifolia
32. Rhododendron catawbiense.
33. Maytenus Boaria.
34. Callistemon.
35. Magnolia grandiflora and Hydrangea.
36. Photinia arbutifolia.
37. Daphne and Spiræa.

PLANTING LIST

For Lot 100′ x 180′.

Group
No.

1. Sugar Maple, Camphor or red Hawthorn.
2. Magnolia grandiflora and Aucuba japonica.
3. Juniperus prostrata.
4. Juniperus prostrata.
5. Three plants of Retinospora in each bed, carpeted with flowers.
6. Pittosporum eugenioides.
7. Boxwood or Laurus nobilis.
8. Heliotrope, Violets, Pansies, etc.
9. Standard Roses.
10. Clematis, Bignonia, Fuchsia, etc.
11. Fence covered with Honeysuckle, Climbing Roses, etc.
12. Mandevilla suaveolens, Solanum Wendlandii, etc.
13. Climbing Roses, Passion Vine, etc.
14. Monterey Cypress.
15. Pepper, Spiræa Anthony Waterer and Romneya Coulteri.
16. Acacia mollis and Diervilla.
17. Libocedrus decurrens and Spartium junceum.
18. Wistaria and Bignonia.
19. Wistaria and Bignonia tweediana.
20. Pittosporum Tobira and Streptosolen.
21. Ligustrum japonicum and Pimelia rosea.
22. Escallonia rosea, Lilac and Prunus Mume.
23. Portugal Laurel and Philadelphus.
24. Hedge of Pittosporum nigricans.
25. Euonymus japonicus aureus.
26. Carnations, Violets, etc.
27. Climbing Roses.
28. Mandevilla suaveolens, Phlox, etc.
29. Rhododendron catawbiense.
30. Climbing Roses, Delphinium, etc.
31. Arbutus Unedo and Ilex Aquifolium.
32. Coprosma Baueri.


GARAGE
LAWN
HOUSE
SIDEWALK
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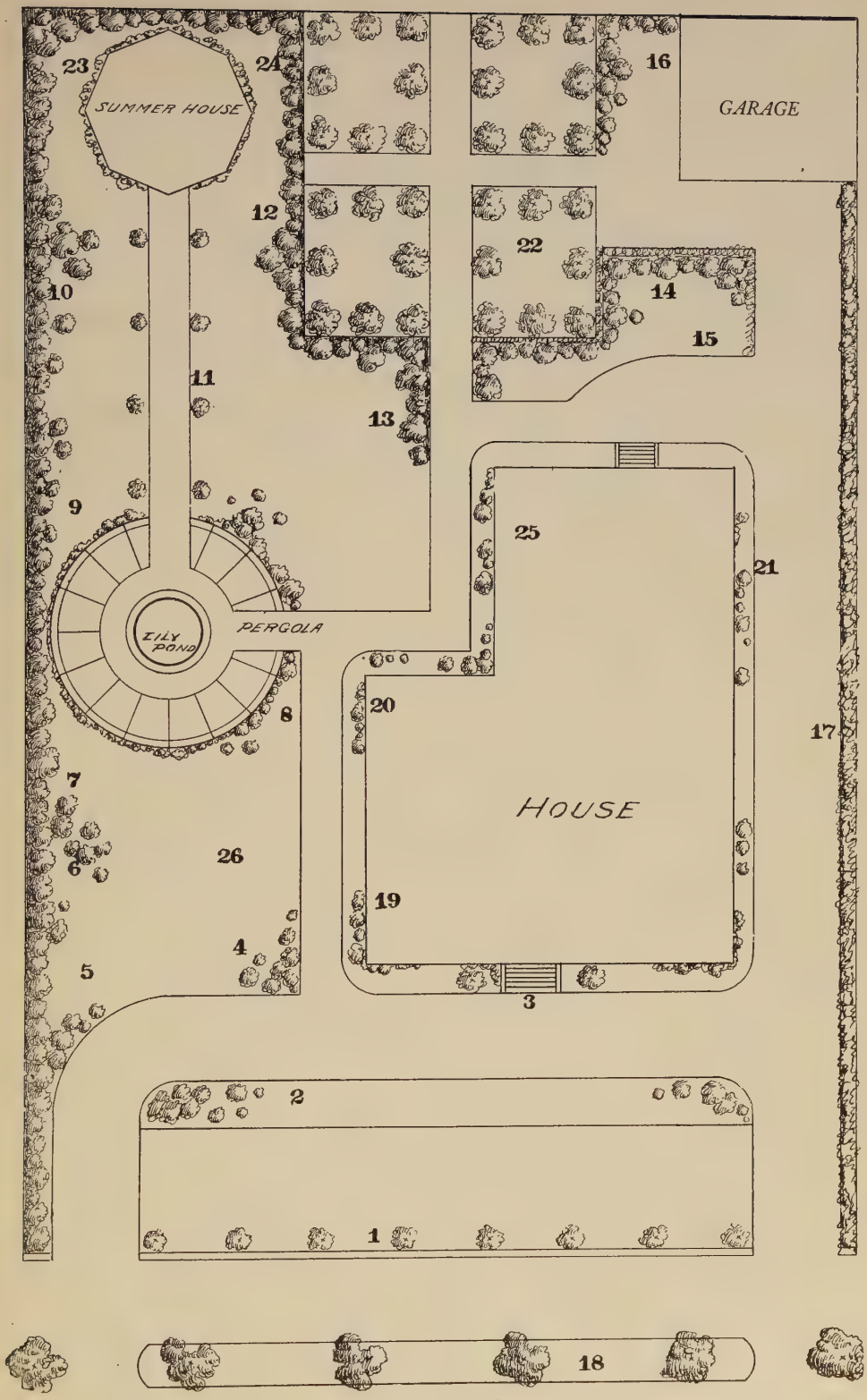
100 x 180

PLANTING LIST

For Lot 150′ x 200′.

Group No.

1. Boxwood.
2. Retinospora obtusa.
3. Choisya ternata and Diosma ericoides.
4. Veronica decussata and Pimelia rosea.
5. Coprosma Baueri and Aucuba japonica.
6. Camphor and Abelia.
7. Rhododendron or Nerium splendens.
8. Wistaria, shading pergola.
9. Bamboo.
10. Portugal Laurel and Acacia mollis.
11. Viburnum Tinus or Laurus nobilis.
12. Acacia latifolia and Philadelphus coronarius.
13. Lilac and Myrtle.
14. Albizzia Julibrissin and Spartium junceum.
15. Pittosporum eugenioides.
16. Hawthorn and Spiræa (bridal wreath).
17. Hedge of Ligustrum japonicum.
18. Huntingdon Elm or Acacia melanoxylon.
19. Roses and other flowering plants.
20. Roses, Carnations, etc.
21. Fuchsias, Hydrangeas, etc.
22. Fruit Trees.
23. Pepper.
24. Monterey Cypress.
25. Geraniums.
26. Lawn.


SUMMER HOUSE
GARAGE
LILY POND
PERGOLA
HOUSE
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150′ x 200′

PLANTING LIST

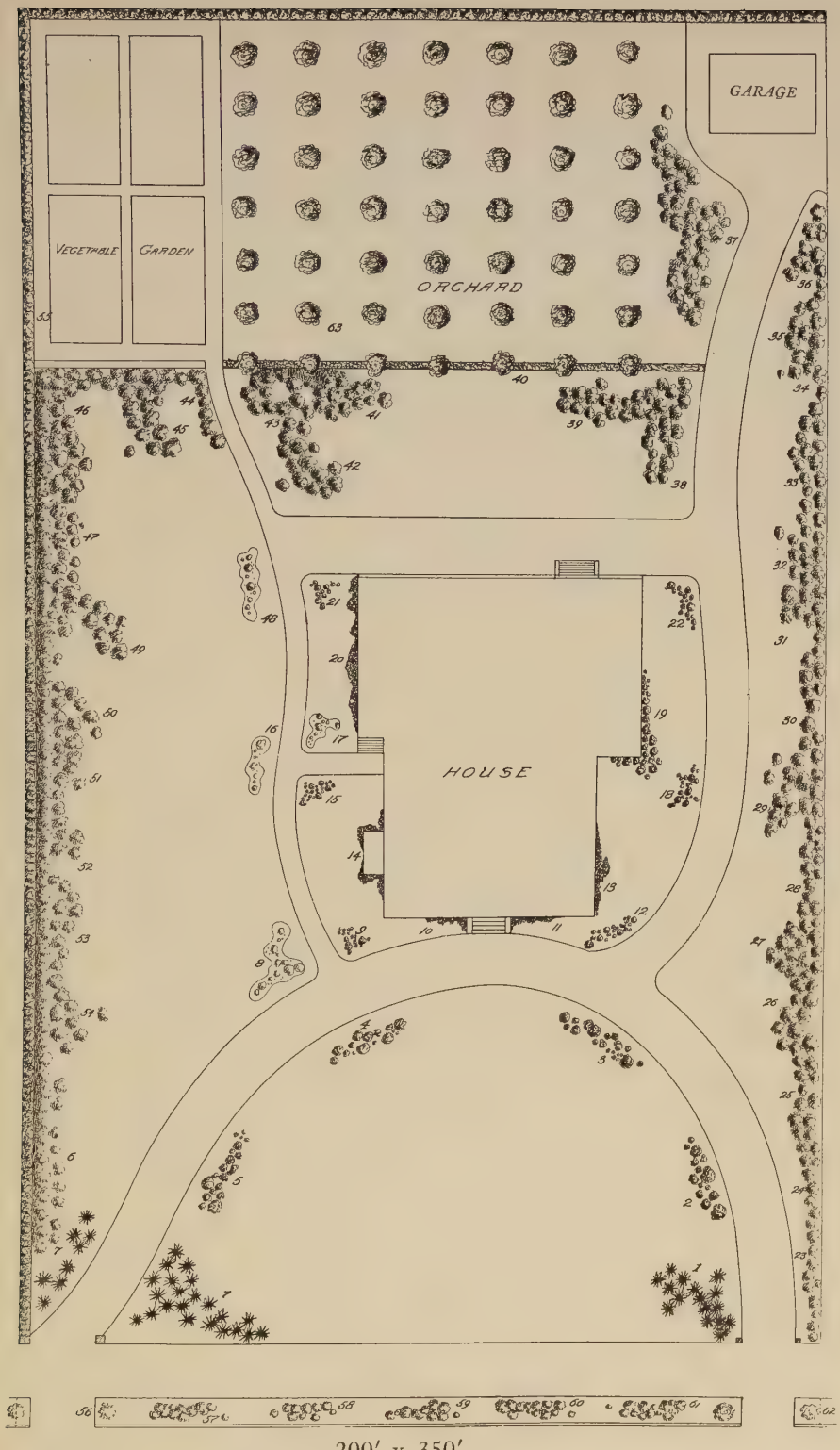
For Lot 200′ x 350′.

Group No.

1. Phœnix canariensis and Honeysuckle.
2. Bamboo.
3. Choisya ternata and Daphne.
4. Choisya ternata and Duranta Plumieri.
5. Bamboo.
6. Coprosma Baueri.
7. Pittosporum eugenioides and Sweet-brier.
8. Maytenus Boaria and Diosma alba.
9. Maytenus chilensis and Sollya Drummondii.
10. Clematis Jackmani and Ivy Geranium.
11. Clematis Jackmani and Ivy Geranium.
12. Veronica decussata and Viola cornuta.
13. Mandevilla suaveolens and Fuchsia.
14. Wistaria and red Geranium.
15. Coronilla glauca and Cytisus racemosus.
16. Myrtle and Carnations.
17. Juniperus chinensis and Juniperus prostrata.
18. Rhododendron.
19. Camellia and Gardenia Fortunei.
20. Ampelopsis Veitchii and flowering plants.
21. Retinospora obtusa and Pimelia rosea.
22. Roses.

Group No.

23. Pittosporum eugenioides and Corynocarpus lævigatus.
24. Escallonia montevidensis and Honeysuckle.
25. Bamboo.
26. Arbutus Unedo and Boxwood.
27. Heteromeles arbutifolia.
28. Camphor and Jasminum nudiflorum.
29. Hymenosporum flavum and Roses.
30. Ligustrum japonicum and Ligustrum Ibota.
31. Sugar Maple and Philadelphus
32. Acacia mollis and Prunus Mume.
33. Portugal Laurel and Japanese Weeping Cherry.
34. Tilia europæa and Viburnum Opulus.
35. Pepper Trees and Leptospermum lævigatum.
36. Monterey Cypress and Spartium junceum.
37. Monterey Pine and Cistus.
38. Liquidambar and Lilac.
39. Liriodendron tulipifera and Lilac.
40. Hedge of Blackberries.
41. Salisburia adiantifolia and Tamarix.
42. Lawson Cypress and Diervilla
43. Quercus macrophylla and Laburnum.
44. Acacia latifolia.



200′ x 350′

For Lot 200′ x 350′—Continued.

Group No.

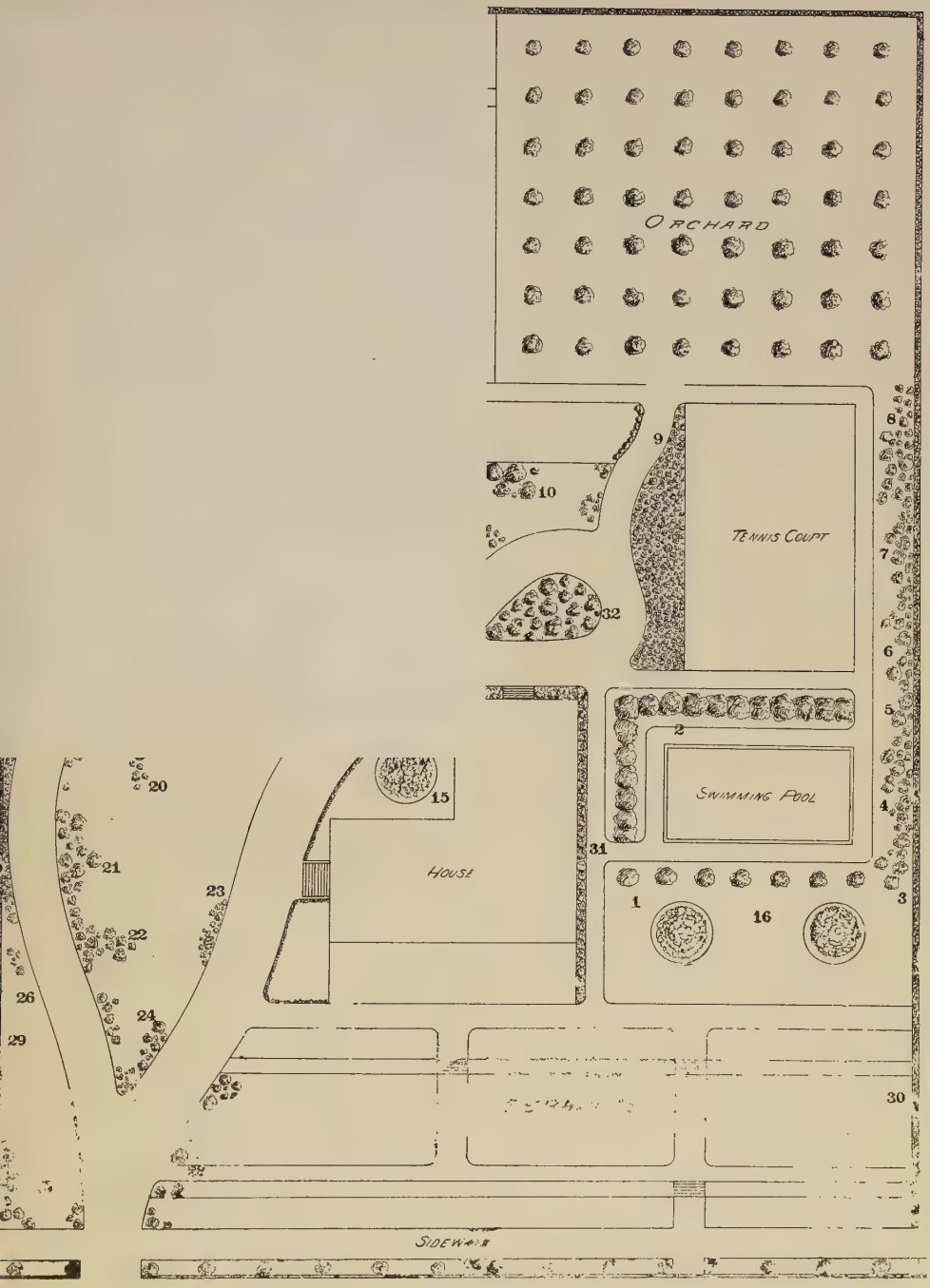
45. Cratægus Oxyacantha and Cratægus Pyracantha.
46. Grevillea robusta and Erythrina Crista-galli.
47. Thuya gigantea and Rhododendron catawbiense.
48. Phillyrea myrtifolia and perennial Phlox.
49. Cedrus Deodara and Abelia rupestris.
50. Abies lowiana and Clianthus puniceus.
51. Prunus caroliniana and Albizzia Julibrissin.
52. Cedrus Libani and Streptosolen Jamesoni.
53. Abies nordmaniana and Swainsonia alba.
54. Bamboo and Pampas Grass.
55. Hedge of Acacia longifolia.
56. Ulmus montana.
57. Juniperus prostrata.
58. Cotoneaster.
59. Juniperus prostrata.
60. Cotoneaster.
61. Juniperus prostrata.
62. Ulmus montana.
63. Orchard.

PLANTING LIST

For Lot 300′ x 400′.

Group No.

1. Boxwood or Nerium splendens.
2. Escallonia rosea, grown thickly so as to form a dense screen ten feet in height.
3. Pittosporum eugenioides.
4. Arbutus Unedo.
5. Portugal Laurel.
6. Corynocarpus and Hymenosporum flavum.
7. Leptospermum lævigatum.
8. Acacia latifolia.
9. Laurus Tinus grandiflora.
10. Cerasus Laurocerasus.
11. Bamboo.
12. Lilac, Leptospermum lævigatum and Prunus Mume.
13. Acacia mollis.
14. Lilac and Callistemon.
15. Ligustrum ovatum, Escallonia rosea and Viburnum Tinus.
16. Flower-bed.
17. Grevillea robusta and Berberis Darwinii.
18. Umbellularia and Romneya Coulteri.
19. Schinus Molle.


ORCHARD
TENNIS COURT
SWIMMING POOL
HOUSE
SIDEWALK
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300′ x 400′.

For Lot 300′ x 400′—Continued.

Group No.

20. Coprosma Baueri.
21. Brahea Sonoræ.
22. Pittosporum Tobira.
23. Choisya ternata and Diosma alba.
24. Veronica decussata.
25. Ulmus montana or Tilia europæa.
26. Escallonia montevidensis.
27. Magnolia grandiflora.
28. Maytenus Boaria.
29. Hedge of Pittosporum eugenioides.
30. Rhododendron hybridum.

PLANTING LIST

For Ten Acre Tract.

Group No.

1. Hawthorn, Lilac and Eugenia latifolia.
2. Cypress.
3. Rock-work with Ferns.
4. Rock-work with Ferns.
5. Acer Schwedleri.
6. Acer Schwedleri.
7. Rhododendron.
8. Large Palm.
9. Rhododendron and Azalea.
10. Rhododendron catawbiense, Camellia and Aucuba japonica.
11. Maple.
12. Linden.
13. Eucalyptus ficifolia and Nerium splendens.
14. Escallonia and Buxus sempervirens.
15. Escallonia.
16. Orange.
17. Lemon.
18. Olive.
19. Redwood, Philadelphus and Cydonia japonica.
20. Redwood and Viburnum (Snowball).
21. Orange.
22. Border for Vegetables.
23. Fig.
24. Peach.
25. Plum.
26. Apricot.
27. Apricot.
28. Peach.
29. Plum.
30. Cherry.
31. Cherry.
32. Pear.
33. Apple.
34. Nectarine.
35. Pear.
36. Apple.
37. Pear.

For Ten Acre Tract—Continued.

Group No.

38. Apricot.
39. Acacia latifolia.
40. Acer campestre and Acacia floribunda.
41. Grevillea robusta.
42. Maple.
43. Linden and Coprosma Baueri.
44. Coprosma Baueri.
45. Corynocarpus lævigata.
46. Araucaria imbricata and Juniper.
47. Cryptomeria japonica and Cryptomeria elegans.
48. Sequoia gigantea and Habrothamnus.
49. Pinus, Liquidambar, Erica persoluta alba and Abelia rupestris.
50. Pinus, Liriodendron tulipifera, Erica and Honeysuckle.
51. Pepper.
52. Camphor and Choisya ternata.
53. Phœnix canariensis.
54. Hymenosporum flavum and Holly.
55. Acacia mollis, Pittosporum eugenioides and Romneya Coulteri.
56. Robinia bessoniana, Myrtle and Viburnum Tinus.
57. Abies and Thuyopsis dolabrata
58. Prunus Pissardi and Prunus Mume.
59. Araucaria excelsa and Retinospora obtusa.

Group No.

60. Picea pungens (Blue Spruce).
61. Escallonia rubra.
62. Albizzia Julibrissin and Quercus Suber.
63. Libocedrus decurrens, Acacia armata and Azara microphylla.
64. Taxus baccata aurea.
65. Weeping Japanese Cherry.
66. Bamboo.
67. Weeping Birch and Spiræa.
68. Redwood.
69. Callistemon.
70. Bamboo.
71. Salisburia adiantifolia and Pittosporum eugenioides.
72. Pittosporum eugenioides and Diervilla rosea.
73. Magnolia and Pittosporum undulatum.
74. Ligustrum Ibota, japonicus aureus and Horse-chestnut.
75. Cedrus Deodara, Cedrus atlantica and Veronica.
76. Cedrus Deodara, Cedrus atlantica and Veronica.
77. Lawson Cypress, Veronica decussata and Polygala dalmaisiana.
78. Large Palm.
79. Cypress hedge.
80. Populus pyramidalis and Populus carolinensis.
81. Espalier for fruit.
82. Leptospermum.
83. Bamboo hedge.

TEN ACRE TRACT

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For Ten Acre Tract—Continued.

Group No.

A. A summer house of stone or wood, rustic in design.
B. Six-foot walk.
C. Six-foot walk through Rhododendrons.
D. Eight-foot border in grass.
E. Niche for statuary or sun dial
F. Low formal basin.
G. Six-foot walk.
H. Formal flower-beds.
I. Space for house-site, one hundred and twenty by one hundred feet.
J. Site for garage or stable.
K. Ten-foot walk leading from house to vegetable garden, covered by an arbor and shaded by grape vines and Wistaria.
L. Range of glass houses.
M. Eighteen-inch walk between the vegetable beds.
N. Vegetable beds.
O. Three-foot walk through vegetable garden.
P. Squares for vegetables.

Group No.

Q. One of the four squares surrounded by fruit trees, the inside of each to be treated as O and P. Outside of the line of fruit trees, cut flowers for the house may be grown.
R. An espalier for trained fruit trees, showing an eighteen-inch walk, two feet from the espalier.
S. Eighteen-inch alleyway for the use of the gardener in working on the espalier.
T. Twenty-five foot border surrounding the vegetable garden, to be used for small vegetables.
U. Fifteen-foot road.
V. Hexagonal summer house of rustic design, of either stone or wood and encircled by a small walk.
W. Four-foot walk, girdling lake.
X. Small lake from two to three feet in depth.
Y. A formal gateway.

NOTE.

All walks in the vegetable garden are to be edged with dwarf box.

CHAPTER III

PREPARATION OF THE GROUND

AFTER the house-site has been selected and the outlines of the drives and walks have been staked, the next operation should be grading and preparing the ground for planting. When grading or leveling, it is necessary to remember to always keep the good or surface soil at the top and not to bury it as is too often done by contractors.

When the ground is graded and shaped to the lines as planned, it should then be plowed or trenched. Where the grounds are large, use the ordinary plow followed by the subsoil-plow; stir the subsoil, if possible, twenty-four inches deep. After plowing, follow with a heavy harrow, selecting dry weather and only when the soil is reasonably dry and not wet enough to stick to the shoes or clog the harrow-teeth; then cross-plow and reharrow.

Should the ground be too small for plowing, trenching with the spade must be resorted to; and here again it is important to bear in mind to keep the top soil for the upper layer.

Trenching should be done by first removing, at one end of the ground, the top soil, to the depth of one foot, from a strip (three feet wide) across the entire width of the ground, and wheeling that top soil to the opposite end of the ground which is being trenched. Then, with a heavy pick, stir the subsoil to an additional foot in depth, leaving the loosened subsoil in its original place. On top of the loosened subsoil spread a layer of manure about four inches deep. Measure from the line of the first trench, with a yardstick, three feet at each end of the trench (that is, at each side of the ground), and place stakes, to which stakes attach a line, which line will thus run across the ground at a distance of three feet

from the line of the first trench. Remove the top soil to the depth of one foot from this strip, and place that top soil to the depth of one foot above the manure in Trench No. 1. Stir subsoil of Trench No. 2, and, on top of that, place a layer of manure, as instructed for Trench No. 1. Then establish the line for Trench No. 3, in the same manner as for Trench No. 2, with the top soil of which (Trench No. 3) Trench No. 2 will be completed, and so on trench after trench all over the ground, the surface soil taken from the first opening, which had been wheeled to the far end of the ground, being found sufficient in quantity for filling on top of the manure of the last trench, thus leaving the ground level or even, and in the same shape as it was before the work of trenching began.

Should the natural soil be composed of stiff clay, a layer of light sandy soil or pure sand, or a heavy application of half-decomposed stable-manure mixed freely with the soil, or, more especially, a compost made of all three will greatly improve it.

Where the soil is of an adhesive nature, or the subsoil within three feet of the surface is of stiff clay, drainage should be resorted to, as, no matter how well the soil may be cultivated or how heavily it may be manured, good results will be impossible if the soil is water-logged. Drains should be put in about fifteen feet apart and three feet deep with a fall of not less than six inches in one hundred feet. Of course where water passes freely through the soil and does not lie stagnant in the subsoil, the putting in of drains will be unnecessary. This may be readily found out by digging a hole with the spade after heavy rains and observing whether the hole holds water any length of time. Should the water percolate freely through the soil no draining will be required, but should the water remain in the hole for weeks, it would be well to have the ground thoroughly drained as directed. Tile draining is much the best and most lasting method, but, when tiles cannot be had, a foot of rough rock placed in the

bottom of the ditch (putting the larger stones in the bottom and finishing with the smaller ones, covering the whole with sods or long straw to keep the soil from choking the crevices) will answer the purpose very well although not so lasting as the tile.

It may be stated that where there is too much water lying stagnant in the soil, few plants will thrive, for, as soon as the roots of the trees or other plants reach the stagnant saturated soil, they invariably show it by their upper twigs or leaves dying off and by their eventually dying altogether.

Drain ditches should be dug just wide enough for a man to work them out. If the top soil is loose, it should be given enough slope to prevent the soil from crumbling into the drain when the tile is being laid. If the soil is heavy and solid, twenty-four inches wide at the surface of the ground will be ample width, tapering to the size of the tile at the bottom, so that the pipes may bed in the solid ground accurately.

Pipe tiles are made of round shape and should be furnished with collars as these tend to keep the tiles from shifting and also prevent, to a large extent, roots from entering and interrupting the flow of water. After laying them, cover the tiles with fine crushed rock or gravel to keep the soil from entering the drains.

Where the ground is undulating in its character, a main drain should be laid along the lowest portion of the ground, and lateral drains laid obliquely according to the shape of the ground, each entering the main drain by a **Y** or **T** shaped fitting, care being taken that each drain has a fall of at least six inches in one hundred feet as formerly recommended.

In digging the ditches for the drains, place the top soil on one side and the bottom soil on the opposite side so that, when filling in the ditches, the subsoil may be replaced and the surface soil saved for the top where it is most needed.

CHAPTER IV

CONSTRUCTION OF ROADS AND WALKS

IN THE chapter on the "Preparation of the Ground" it was advised that, after the land had been plowed, the subsoil plow should be used, and the ground thoroughly harrowed, then cross-plowed and again harrowed. Finally it may be rolled with a two-horse roller so as to break up the lumps of earth and leave the surface reasonably even and smooth. It has also been advised that, in order to show the proposed lines of the driveways and walks, a center line of stakes should be set according to the adopted plan, and at the same time it was urged that the lines of these driveways and walks should be most carefully studied from all points until it was felt that they were the best possible.

Assuming then that these preliminary points have all been attended to, the next step toward the construction of roads and walks is to have two lines of stakes set equally distant from the center line showing the width of the proposed walk or driveway. If for a driveway, these stakes should be set not less than eight feet from the center line of stakes, and thus sixteen feet apart from each other, as a driveway with a width of less than sixteen feet would be too narrow for two carriages to pass comfortably, and, besides, would give the grounds a pinched contracted appearance.

If the stakes are being set for a foot-path, they should be set four feet from the center stakes, and thus eight feet apart from each other. A foot-path eight feet wide has enough width and looks well in the grounds.

As formerly suggested, it is again urged that all the good surface soil should be removed from the proposed road-bed (whether of driveway, walk, or any other contemplated gravel surface) and spread over those parts of the grounds where the natural soil is poor and shallow, or, if not required

for that purpose, in any low spots which may need leveling up.

When this is done, the center line, as well as the side lines of stakes, should be carefully reset about every fifteen feet

Walk with Rustic Benches. Background of Pines and Firs.

along the proposed roadway. Then three lines of levels must be run along the road-bed, one in the middle and one on each side. The cuts and fills must now be figured out, and the grade established, the quantities of soil to be moved being carefully figured so that the cuts and fills will balance each

other, always keeping in view the economy of having the dirt moved as short a distance as possible.

After this is all calculated, it is time to have the grade-stakes set, one at the base of each of the line-stakes.

When setting the border grade-stakes, it must be seen that the stakes, on opposite sides of the road to be graded, are set exactly level with each other, for unless the two borders of the roadway or foot-path are level, not only does the road never look well, but it is not comfortable to walk or drive over. As the grade-stakes will be set alongside the line-stakes, they also will be at intervals of fifteen feet on the roadway, it being inadvisable to have them further away from each other. These grade-stakes should have sawed, square ends not less than one inch square.

After the border grade-stakes have been put in place, still another line of grade-stakes should be set, at equal distances apart, along the line of the road-bed, to guide the workmen in the grading of the surface. These grade-stakes should be set so as to give the road-bed a crown of one in sixty; for example, if the roadway is sixteen feet wide, it should be about three and one-half inches higher in the middle than at the sides, so that the rains will run off the middle of the road toward the sides, leaving the center of the roadway dry. Great care must be taken in this part of the work, as a road or walk has not a good appearance when there is too great a rise in the middle, and that such a road or walk is inconvenient and almost unpleasant for walking or driving over, will be evident. In staking the rise, the width of the road must always be taken into consideration, otherwise great mistakes may be made, and a walk which is eight feet wide should have no more than the proportion just mentioned, which would be a rise of one and three-quarter inches from the sides to the middle.

At each of the grade-stakes, stout witness-stakes should be set, close against each grade-stake, and projecting about two feet higher, so that in the event of the grade-stakes being

covered over with dirt, they may always be located by the witness-stakes, and thus the work will not be delayed through a surveyor having to be found to locate the lines or the grades.

For a driveway, the border grade-stakes should be set eight inches above the proposed finished gravel surface, thereby

Formal Gardening. Walks Converging to Fountain. Background Heavily Wooded

giving room for five inches of crushed rock and one inch of fine finishing rock, and thus leaving the border of soil about two inches above the finished rolled surface of the roadway.

For a walk, the same course in grading should be pursued, only in this case the border should be graded six inches above the grade of the walk instead of eight inches as recommended for the driveway. This would give four inches for the depth of rock, that depth being sufficient for a foot-path.

When these stakes for the driveway have all been set, the roadway can now be leveled to the required grade, namely,

eight inches below the top of the established border grade-stakes, and six inches below the top of the road-bed grade-stakes.

Of course, some portions of the natural grade will be found to be above and other portions below the proposed grade of the driveway, but, all this having been carefully planned out as suggested earlier in this chapter, the portions of the road-way which are too high will now be moved to fill up to grade where the ground is too low. This part of the work is very easily carried out when it has previously been carefully planned and has also been surveyed and staked, so that the workmen will know both how deep to cut and to what grade they are to fill in.

Various materials may be used for the bottoming of roads and walks, such as stone, brickbats, clinkers, or, in short, any hard substance which contains nothing that would injure the roots of the plants. It is important to keep this in view, as plants situated near the border of a road quite frequently send their roots under the road-bed, and, if material injurious to plants were used, the plants could not fail to suffer. Each neighborhood generally has some local quarry which contains rock quite good enough for forming roads or walks for a pleasure-garden and grounds. Crushed rock of a brown color has a much better color effect, as contrasted with the green of lawns or shrubbery, than rock which is of a gray or white shade.

Before commencing to haul the rock for bottoming the road-bed, it should be seen that the road-bed is well shaped, evenly crowned, and rolled hard, for unless the road-bed is properly shaped before the rock is spread, it is almost impossible to get a good road, because the foundation rock would necessarily be of uneven depth and could not be evenly rolled. Besides, leaving the road-bed uneven would be the cause of greater expense, as the road would, in that case, have to be evened up by rock, and, as the expense of hauling rock is very considerable on account of it generally

having to be brought from some distance, it would be much more expensive to fill up a road-bed in this way than by grading it with dirt from the grounds.

The road-bed then being in shape and rolled smooth and hard, the work of setting the bottom rock should be commenced. Any kind of rock will be found good enough for

Driveway showing California Laurel (to the left of Illustration) and Oaks; also Ivy-Covered Stump.

the foundation layer of the driveway, provided it is not over two inches or two inches and a half in diameter. A mixture of all sizes up to six or eight inches in diameter does not make a good roadway, for it cannot be rolled evenly, nor does it form a close finish, as it leaves large open spaces and hard unevennesses. This bottom layer should be evenly spread about five inches deep. After the rolling is all done, the surface should be gone over with a shovel, and any ruts or chuck-holes which may have been left by the wagon wheels should be filled in, the object being to leave the whole surface

as even as possible. It should then be rolled with a heavy roller at least three times, or until perfectly smooth. There must then be a layer of finishing rock or gravel which will pass through a half-inch mesh, spread evenly over the entire surface about one inch deep and rolled into proper condition.

This finishing coat, as a rule, is not put on until all the heavy work on the roads (such as hauling material for buildings and planting the grounds) has been completed.

Walk Lined with Dracaenas.

CHAPTER V

PLANTING AND TRANSPLANTING

WHEN the ground has been got ready for the reception of plants in accordance with the suggestions made in Chapter III, the next operation is the planting of the trees and shrubs according to the plan which it has been strongly advised should be carefully prepared in full detail before the actual work of planting is begun.

It will be remembered that if the place is large, the ground should have been plowed, and the subsoil plowed, cross-plowed and harrowed, or, if the place is too small for plowing, that the ground should have been trenched and then raked to an even surface.

The soil then having been thoroughly cultivated and being in good condition to be worked (that is, neither so wet that it will stick to the spade or trowel when being dug up or to the feet when treading it, nor, on the other hand, too dry and hard), mild weather with a moist atmosphere must be selected for the time of planting. If the air is very dry and a harsh wind is blowing, the work must be postponed until the dry spell is over, as a plant transplanted under these conditions is apt to suffer. If, however, the transplanting has to be done in very dry weather, shading must be resorted to until the plants make fresh roots. This is more necessary in the case of evergreens than of plants which are without leaves, for the reason that in those plants having leaves, the surface from which evaporation takes place is much larger (being at least six times greater) than in similarly sized plants not having leaves.

Deciduous trees may be safely transplanted in any month between the fall of the leaf in Autumn and the swelling of the

bud in Spring, provided, of course, the soil is in good condition.

Our hardy, native Pine and Cypress do well if transplanted in November, December, January or February.

Eucalyptus, Acacia, and most of our New Holland, Australian and New Zealand plants do best if the planting or transplanting is delayed until Spring, or until the danger from heavy rains and cold weather has passed.

The operation of planting varies according to the nature of the plant and the natural disposition of the soil. Some plants root deeply, sending strong taps into the soil, while the roots of others creep along close to the surface. It must be carefully kept in view, when planting, that the roots should be placed as nearly as possible in the same position as they were before they were removed from their previous location.

In transplanting deciduous trees, they should be taken up very carefully so as to preserve as many of the roots as possible, the constant aim being to prevent injury not only to the roots, but also to the branches so that they may have few wounds and bruises to heal when in their new quarters.

After the ground has been prepared carefully in accordance with the former suggestions, the hole must be dug for the reception of the roots of the plant to be transplanted. The size of the hole, of course, depends upon the size of the plant, but it is better to make it too large than too small. If it is made too small the roots are very liable to get cramped and crowded into wrong positions. The hole should be large enough to allow all of the roots to be spread out to their full length and in their natural positions; the depth of the hole should permit the neck of the plant to be as near the surface of the ground as it was originally.

There is a difference of opinion as to whether the hole should be circular or square. The square form should by all means be preferred, not only because it is dug more quickly, but also for another reason of greater importance:—when the roots, in their natural extension by growth, reach the

wall of a circular hole, they are in danger of following the line of the circular wall and thus confining themselves into a space the size of the original circular hole, instead of extending into the wall and thus into the adjoining soil as they will certainly do when the hole is a square one.

When digging the hole, the best soil should be placed on one side, and the poorer soil on the opposite side. The hole should be made quite as wide at the bottom as at the top and should be deeper at the sides than in the middle, and thus the surplus water will run to the sides of the basin rather than lodge in the center.

After the hole has been got ready, the plant should be examined. If the top is not uniform and equally balanced, it must be pruned into uniform proportion. It must then be carefully seen that the roots are not matted or crowded. If the roots are found to be matted or crowded they must be disentangled and cut back to sound wood, and, if any of them are bruised, these should be cut back with a sharp knife. The roots should then be placed in the prepared spot to find out whether the hole is of the proper depth. It may be found that the neck of the plant is too high or too low, and the hole must be lowered or filled in, as may be necessary, to remedy this, it being always borne in mind that the bottom of the hole on which the roots are to rest should be of convex form, not only for the reason just mentioned regarding the drainage of the water, but so that the roots will point in a downward direction as in their natural state, rather than in an upward direction as too often happens from neglect of this precaution. The roots should also be as equally distributed over the surface of the bottom of the hole as possible, or as nearly so as they were before transplanting, and as their nature will permit.

A light spreading of fine, well-pulverized soil should then be spread over the roots to the depth of about two inches, the soil being thrown from the stem of the plant toward the ends of the roots. This is of considerable importance, as the

throwing of the soil from the ends of the roots toward the stem has a tendency to double up the roots, not only thereby injuring them by twisting, but, when they start into growth, causing them to grow toward the stem and to crowd into bunches and mat around the stem, instead of starting away from the stem in search of fresh soil, as they would do under natural circumstances.

When the roots are covered with two inches of soil, it is necessary to shake the stem a little so as to get all the soil settled among the roots. Then the hole should be filled in, to within three inches of the top, and should be given a good soaking of water. The hole should be filled with water two or three times, this being allowed to entirely soak away; when the hole is partly dry, it should be filled up to the top with soil.

Should the tree, which is being planted, be over four feet in height, it would be well to stake it with a stout pole, the tree being tied securely to the pole to prevent the action of the wind from moving the tree before it has made fresh roots.

In the case of a large deciduous tree, the stake should be driven into the bottom of the hole before planting, and the roots spread about the stake, for, if the stake should be driven into the ground after the tree is set out and the hole filled in, the driving in of the stake would very likely injure and disturb the roots.

If a stake should be required for an evergreen plant, it should be driven obliquely into the side of the hole and clear of the roots, and, of course, the plant should be tied securely to the stake.

In staking or supporting a newly planted tree or shrub, great care must be taken to prevent the bark from being injured through rubbing against the stake. In order to prevent this, a padding of old rubber or a wisp of straw, or some other soft material, should be placed between the stake and the stem of the tree. A plant, which has been staked, should be examined about once a month to see that the tie is not

cutting into the bark by the natural swelling of the stem, or that the padding has not been forced out of position, thus allowing the bark to rub against the stake by the action of the wind.

After the planting and staking is all completed, it is a good plan to mulch the ground with horse-manure half-rotted, spread to a depth of about three inches. Mulching is a good means of preserving the moisture and keeping the soil at an even temperature. It also prevents the soil from cracking, and proves beneficial through its substance being washed into the soil by rains or artificial watering.

When it is desired to move *large* trees and shrubs for transplanting, the following method is recommended as one which has been thoroughly tried and proved to be effective.

In April or May a year before the tree or shrub is to be moved, dig, around it, a trench deep enough to reach the main side-roots; cut all the side roots with a sharp knife; encase the ball of earth surrounding the tree roots with boards of sufficient strength, care being taken that there be a space of three inches clear between the ball of earth and the boards. Fill this three-inch space with good friable sandy loam mixed with leaf-mold (in the proportions of two parts loam and one part leaf-mold) tamping the soil firmly with a piece of stick about eighteen inches long by one inch by two inches; then fill in the soil about the encasement and give a good watering.

The following year, when the plant will be ready for removal, dig around the encasement and excavate under the tree or shrub, cutting the tap roots and bottoming the box with boards of sufficient strength. If the tree or shrub is more than ten feet in height, nail a board to each corner of the box, these boards to be the height of the tree and braced by strips nailed to each. After the boards are in place and properly braced, tie the stem of the tree to each of the four upright boards so that there will be no risk of the stem moving either at the root or at the top; then raise the box con-

taining the tree or shrub by hydraulic pump jacks or by other raising apparatus and load it on a truck to be moved to the place selected.

Before moving the tree or shrub have the selected site properly graded. Dig a hole of the proper depth and at least six feet wider than the ball of the tree to be transplanted, having a sufficient quantity of good soil ready to fill the hole; lower the tree into the hole, taking off the boards; fill in with good soil, tamping it firmly; for every three inches of fill give a good watering. See that the tree or shrub is stoutly staked, or, if very tall, braced with four guy ropes equally distanced. Attach the guy ropes to stakes driven into the ground at a distance from the tree equal to its height.

Lawn Outline. Eucalyptus and Coniferae.

CHAPTER VI

LAWNS

IN PREPARING the part of the site which it has been decided shall be laid out in Lawn, it is of great importance, and will prove to be true economy, to see that the preliminary work is done with the utmost carefulness, for if proper care is taken at this stage, there will not be the annoyance, the loss of time and the expense of having to dig up the lawn and practically do the work over again, which so often has been experienced by owners of homes where the lawns were made by men who either were careless or did not thoroughly understand what was necessary to be done.

As this preliminary work varies to a certain extent according to the class of soil, it will be well in this chapter on Lawn-making to refer to the four most usual classes of soil met with, namely, clay, brown loam, black adobe and light sandy soil.

When the soil is clay, it is necessary that it be trenched at least two feet deep. If the work is done in the Summer season, the soil should be turned up and left in rough condition as long as possible—say about six weeks—until it gets thoroughly dry and warmed by the sun. It then must be generously manured (the best for this purpose being light stable-manure well rotted), this manure to be spaded in one spade deep, care being taken that the soil is thoroughly pulverized and broken as the work goes along. It should then be shaped and graded and raked smooth, rolled with a light roller and then raked again, the lawn being now ready for the seed, but it is strongly advised that, before the grass seed is sown, the first crop of weeds should be allowed to germinate, and that then the ground be gone over with a light scuffle hoe which will kill all the weeds if the hoeing is done in dry weather. Taking this extra precaution will save the grass from afterwards having to struggle for existence with

the weeds. This hoeing will leave the ground too rough for seed, so it must be raked again before sowing.

The grass which makes the best lawn, and the lawn most easily kept in satisfactory condition, is Kentucky Blue Grass. The mixing of clover or any other grass seed with Kentucky Blue Grass seed is not recommended. When purchasing the seed, see that it is perfectly clean and fresh, the quantity required being about half a pound of seed to one hundred and fifty square feet of lawn. It must be sown as evenly as possible, a time for sowing being selected when there is absolutely no wind; as the seed is very light too much stress cannot be laid upon this point. Immediately after sowing, the ground must be raked very lightly with an iron rake. The raking must be done lightly, as none of the seed must be moved or dragged into bunches, the object of this raking being to cover the seed not more than a quarter of an inch, and to have it as evenly distributed as can be managed. When doing this, the one who rakes must have two wide boards to stand upon and walk over, so that his feet will not mark or indent the surface of the soil, as such indentations, of course, would make an uneven lawn. If this Kentucky Blue Grass seed can be successfully sown, it makes the best lawn, the closest turf, and the most velvety surface, and is well worth the extra preliminary trouble. The other strong grass seeds, as the English Rye and the Orchard, are apt to run into bunches and tufts.

It is well to remember that the results from the Kentucky Blue Grass seed are considerably slower than from the coarser grasses. With this grass it takes about three months to form a turf when the seed is sown in the best season, which, in the middle and northern counties of California, is during April and May, or immediately after the cold rains are past. In the Southern and frostless regions this grass may be sown earlier in the year.

No water should be applied to the lawn until the seed has been in the ground at least two days. Then the ground

should be given a thorough soaking and should be kept continually moist (by watering once daily during dry weather, the evening being the best time for this watering) until the young growth is at least one inch high when three waterings per week should be enough.

When the young grass is about one inch high, the lawn should be gone over again with a light roller, the one who does the rolling being careful to use two boards similarly to

Lawn with Tree Groups.

when raking as suggested above, these two boards being necessary for the same reason, namely, to avoid indenting the lawn by boot marks. After this, all that is required is to water when dry, and mow as often as is necessary, which in ordinary circumstances is about once a week.

Should a rougher lawn than this be required, or, in the Winter months should a lawn effect be desired more quickly than can be secured from Kentucky Blue Grass, English or Australian Rye Grass will give a good lawn effect during that part of the year. Treat the ground as recommended

above for Kentucky Blue Grass. Sow the Rye Grass seed (not mixed with any other seed) thickly, and rake in a little deeper than the other, say from three-eighths to one-half an inch in depth, otherwise carefully keeping in view the same suggestions regarding sowing, watering, etc., as for Kentucky Blue Grass.

In some instances Bermuda Grass has been used for lawns, but on account of its dry, dead effect during Winter, and the fact that it is difficult to eradicate, it is not considered suitable for a good lawn, and is certainly not to be compared with the others in any way.

With reference to what is said in this chapter as to the inadvisability of mixing Clover or anything else with Blue or Rye Grass, and as to the results obtained from these grasses, it should be mentioned that experiments have been made with Lippia reptans, which is a dwarf creeping-plant, with a small oval leaf and a purple flower. This has been tried and even recommended as a substitute for grass. These experiments have not been successful, and, as the prevailing color effect is a purplish gray, it lacks the refreshing green effect of a good grass lawn.

With regard to Clover, which is of strong growth, it requires more water than grass and spreads so as to kill the grass. One great objection to Clover is the stubby effect when newly cut, and as a good lawn should be cut about once a week, this is of great importance. There are many other grasses which might be sown, but they are either too fine or too coarse for practical lawn purposes.

In young lawns, notwithstanding the killing of the first crop of weeds, as explained in the early part of this chapter, it is to be expected that many weeds will germinate and grow with the grass, but these must be weeded out as soon as they are large enough to be pulled up, especially those weeds which have perennial roots such as the Thistle, the Dock and the Dandelion. On no account should the Dandelion be allowed to seed. It must be eradicated at once, because if only one

flower-stalk or head is allowed to ripen its seeds, it will completely ruin a lawn in a short period. There are myriads of seeds in one of these flower-tops, and when they are allowed to spread they spring up in a few days and do an immense amount of damage.

When the soil is of brown loam or black adobe, the treatment above suggested applies equally well, but it must be kept in view that should the soil be brown friable loam naturally well drained, all that is necessary at the beginning is to grade the ground in the shape desired, and, instead of, as in the case of clay soil, trenching two feet deep, digging one foot or one spade in depth will be enough. The applying of manure and the rest of the work should be done as advised in the case of clay soil.

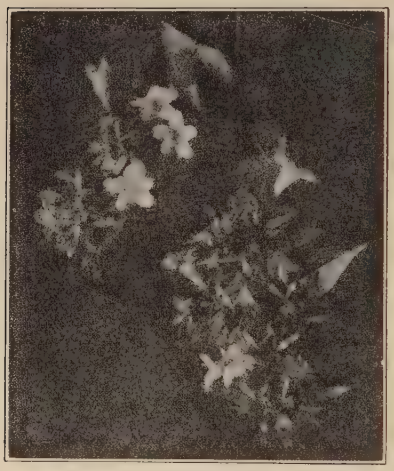
If the natural soil of the site, where the lawn is to be, is poor sand, this sand must be removed to the depth of at least one foot and replaced with good loam. The loam should then be manured and the rest of the work done exactly in the same way as recommended for the other soils.

CHAPTER VII

TREES AND SHRUBS

Abelia

THE Abelia is one of our most free-flowering shrubs, being in flower nearly every month of the year. It is neat and compact in its habit of growth and is excellent for finishing groups of stronger-growing shrubs.



Abelia rupestris.

The flowers of the Abelia, which are lilac or pink and bell-shaped, are sweet-scented and pretty.

There are four varieties of the shrub. Abelia rupestris and Abelia serrata (natives of China), Abelia floribunda (a native of Mexico) and Abelia triflora (a native of India). They flourish in any good garden soil and in any situation which is not too much exposed.

The Abelia rupestris, grouped with Veronica decussata, Maytenus Boaria or Leptospermum lævigatum makes a very effective combination, all of these being of similar habit.

Propagate by cuttings placed in sandy leaf-mold in a cold frame during September or October. When rooted, they should be placed in three-inch pots and given root-room as required.

Abies mertensiana.

Abies (*Fir*)

A genus of about twenty-five species, all giving a grand effect in the landscape, whether in group form or singly in the park or lawn. Most of the species are lofty conifers, massive, symmetrical and handsome, many of them with the under side of the leaves of a silvery white. All are hardy and delight in a cool moist atmosphere and a well-drained soil.

Abies Morinda.

A number of the finest of the species are indigenous to California, Abies amabilis, Abies grandis, Abies Douglasii, Abies bracteata and Abies mertensiana preferring the cool coast counties, while our other indigenous species, including Abies nobilis, Abies magnifica, Abies pattoniana, Abies concolor, etc., seem to prefer the high valleys and ridges of the Sierras. Many of the exotic species, such as Abies nordmanniana from the Crimea, Apies pectinata from Central Europe, Abies cephalonica from Greece, and all of the Asiatic species, such as Abies Morinda, seem to be at home with our natives, and, when growing side by side, with the same exposure and treatment, do equally well. The Eastern species, including the beautiful Abies balsamea, seem also to thrive, especially when given a sheltered half-shady situation.

Propagate by seeds sown, in February, one-eighth of an inch deep, in a cool frame; give them plenty of air and protect them from small birds until they are three inches high when they should be pricked off, two inches apart, into boxes, left there one year, and then transplanted into nursery rows.

Abutilon (*Bell-flower*)

A class of shrubs noted for their free-flowering and showy appearance, belonging to the mallow family. Few excel them as ornamental flowering shrubs for decorating the shrubbery, especially if they are given a sheltered situation on a sloping bank where the flowers may be viewed from below. They thrive well in any good garden soil with ordinary treatment.

Abutilon.

There are many varieties, including Abutilon admiration, Abutilon fire king, Abutilon purpurea, Abutilon Boule de Niege, etc., besides many variegated forms, all worthy of cultivation.

Propagate by cuttings inserted, in pots or boxes, in soil composed of half sand half well-decomposed leaf-mold, in July or August. Place them in a cold frame and shade them for a few days.

Acacia

A genus of highly ornamental and decorative shrubs or trees, natives of New Holland, South America and North Africa. Most of the evergreen species came originally from Australia and are among our special favorites. All are vigorous growers and abundant bloomers. If carefully selected, they may be had in bloom every month of the year, beginning with Acacia longifolia, which flowers in January, followed closely by the beautiful fern-leaved Acacia mollis with its great masses of sulphur-yellow racemes on a tree from forty to sixty feet in height, with a spread of branch as much in diameter. This stands without a rival as a flowering tree in our early Spring months.

The Acacia is a very extensive genus, the number of species being nearly four hundred. Over one hundred species have been introduced into California and almost all of them have proved to be perfectly hardy, growing freely in any soil and standing exposure to our harshest winds, while one, at least, rivals our hardiest trees in standing salt winds, growing almost within touch of salt spray on the poorest land.

Acacia armata.

Among the best of the shrubby species are Acacia armata, Acacia cultriformis, Acacia baileyana, Acacia floribunda, Acacia linearis, Acacia longifolia, Acacia riceana, etc., and of those which assume tree form, Acacia dealbata, Acacia decurrens, Acacia mollis, Acacia melanoxylon and Acacia lophanta.

Acacia baileyana, one of the earliest to bloom, opens its great bundles of yellow flowers early in January. Its silvery fern-like foliage, blending with its beautiful flowers, makes it a charming object in garden or shrubbery. It grows to the height of thirty feet. Acacia mollis blooming in February, Acacia pycnantha flowering in early Summer, Acacia cultriformis a little later and Acacia calamifolia in late Fall, make a continuous season of bloom throughout the year.

Acacia lophanta.

Propagate by seeds sown one-eighth of an inch deep in a

cold frame or greenhouse in March; prick them out into pots or boxes when they are three inches high and plant them out in permanent quarters the following Spring.

Acer (*Maple*)

A genus of highly ornamental, hardy, deciduous trees or shrubs greatly valued for the effect produced either when planted in group-form in our large grounds or when growing as single trees on the margins of lawns or again as sidewalk trees on sheltered streets. The Maple loves a sheltered situation in a soft moist soil, and plenty of water at the root during the growing season.

Acer Negundo stands exposure better than any other species, and, in good soil, makes a fine shade tree even when given considerable exposure. Acer macrophyllum, our native species, becomes a handsome tree of large proportions with a stately stem often three feet or more in diameter and branches to the height of twenty feet, its spread of limbs shading an area from seventy-five to one hundred feet across.

Acer campestre, the English Maple, is a small tree with small cordate leaves.

Acer japonicum, the Japanese Maple, and its varieties make an effective shrubbery group, their deeply cut, variously tinted leaves being very beautiful.

Acer saccharinum, the Sugar Maple, is one of the very best of our deciduous trees. Where given good soil and a situation not too greatly exposed it makes a fine tree either for the side-walk or as a single specimen on the lawn.

Acer Schwedleri gives beautiful color effects in early Spring and also in the Fall.

Our native Acer circinatum, the dwarf species of Acer japonicum and its varieties, and the many varieties of Acer

palmatum make beautiful shrubs early in Spring when the young leaves first open, and again in the Fall when they take on their Autumn tints of red and yellow.

Propagate by seeds sown, as soon as ripe in Autumn, in the open ground, covering the seeds about one-quarter of an inch deep. The rarer varieties and the variegated forms are propagated by grafting in Spring or by budding in Summer on the common species.

Achania (*Turk's Cap*)

The Turk's Cap (named from its scarlet cap-like flower) is a very pretty evergreen flowering shrub with heart-shaped leaves of pale-green belonging to the genus Malvaceæ. It requires a sheltered situation and partial shade (such as under the branches of a deciduous tree away from strong sunshine and protected from frost) and grows freely in any good soil not too heavy.

Achania Malvaviscus.

Propagate by placing cuttings of half-ripe wood in sandy soil in a cool frame in September and shading them from sunshine until rooted; when rooted, pot them singly in three-inch pots and plant them out the following Spring.

Æsculus (*Horse-Chestnut*)

A well-known hardy ornamental deciduous tree with showy flowers and compound leaves, well adapted for single

specimens on large lawns. It does well in any good deep soil protected from the harsh wind.

There are several fine species incuding Æsculus Hippocastanum (the common European variety), Æsculus californica (the common Buckeye), Æsculus glabra (the Ohio Buckeye) and a red-flowering variety named Æsculus carnea; all are handsome and very desirable.

Plant the seeds, as soon as gathered, one inch deep in nursery rows one foot apart; replant them in their permanent situations when they are four feet in height.

Albizzia Julibrissin

One of the most beautiful of our small flowering trees, of wide-spreading habit with fern-like foliage and great sprays of delicate pale-pink flowers, blossoming in July and August after most of our flowering trees are past bloom.

Albizzia Julibrissin.

The full effect of the beauty of this most interesting tree is had when it is planted on a rising ground, against a background of pine or other dark foliage, in the full sunlight in which it seems to delight. In the warm interior valleys it should do exceedingly well if planted in good, well-drained soil and given some attention in the way of cultivation and a little water occasionally at its roots.

It should be grown extensively both in the garden and as a sidewalk tree.

Being a native of Armenia and the Levant it thrives in the climatic conditions along our coast and even in San Francisco.

Wherever it has been planted and given a little care it has proved to be one of the best trees for showing grand effects in late Summer and early Fall.

It should not be planted in heavy clay soil or in a situation where water lies on the surface at any time.

Propagate by seeds, sown one-quarter of an inch deep in heat, in February or March (or as soon as received); give pot-room as required. Cuttings are seldom successful.

ALNUS (*Alder*)

A genus of hardy deciduous trees or shrubs which delight in moist situations, preferably on the banks of a perennial running stream. They form handsome, upright, clean-stemmed trees with roundish leaves and grow to the height of from fifty to eighty feet. They are not particular as to soil, provided they are given plenty of water at the root and a sheltered situation.

Propagate by seeds sown, in early Spring, in the open ground and covered not more than one-quarter of an inch deep; the following Winter, plant them in nursery rows one foot apart; when they are three feet high, replant them where they are to remain.

ALOYSIA CITRIODORA (*Sweet-Scented Verbena*)

Hardy deciduous shrubs with sweet-scented leaves and inconspicuous lilac-colored flowers. In the Eastern States and in Europe these shrubs are grown in the greenhouse where they are general favorites for cutting. In California they grow to the height of ten feet or more, having trunks six inches (and even greater) in diameter. They flourish in any good garden soil and stand a reasonable amount of exposure.

Propagation of the Aloysia is effected by cuttings of the young wood placed in sandy soil in a cool frame in early Summer. They should be shaded, during sunshine, for a period of two weeks and should be potted singly in two-inch pots as soon as the cuttings are rooted.

Amygdalus (*Almond*)

This well-known hardy, ornamental, deciduous, vigorous grower is one of the earliest and most free-flowering of our trees and shrubs, the common single sometimes opening its pink blossoms as early as the middle of January, followed by the double-flowered varieties which succeed each other carrying the season well into April.

Any good soil, if well drained, suits the Almond, and, if the soil is kept cultivated, the tree requires no artificial irrigation except in very dry seasons.

The single flowered species are propagated by seeds planted one inch deep in the open ground, in Fall or early Spring, and the double varieties by budding on the common Almond or on seedling plum-stocks in Summer.

Araucaria

A genus of noble evergreen trees of vigorous habit and formal symmetrical outline, having horizontal branches in regular whorls, natives of South America and Australia. All are very desirable trees for large grounds and parks.

They delight in a good strong loam free from stagnant moisture but must have frequent waterings at the roots during the Summer months.

Araucaria Bidwillii, Araucaria brasiliana, Araucaria Cookii, Araucaria excelsa, and Araucaria imbricata all make splendid ornamental trees in this climate.

Propagate by seeds planted point down and pressed into the soil half their length, as soon as received (no matter at what time), in a cold frame and left without being disturbed until the following Spring when they should be planted in nursery rows and again transplanted each year until large enough to be placed in their permanent sites.

Arbutus

Among the many species of Arbutus are several of our most handsome evergreen trees. The Madrone (Arbutus Menziesii) and the Strawberry tree (Arbutus Unedo) both do splendidly in California. Their large, glassy, smooth leaves of elliptical shape, their fragrant, heath-like white flowers and their bunches of red or yellow berries in the Autumn make them features in the landscape or shrubbery.

Propagate by sowing the seeds in the open ground as soon as they are ripe, covering them to the depth of a quarter of an inch. Transplant the seedlings, when a year old, into nursery rows, setting them six inches apart. They should be replanted each year until they become large enough to be planted where they are to remain.

Aucuba japonica

A genus of evergreen hardy shrubs with smooth and glossy laurel-like leaves, bearing bunches of scarlet berries late in the Fall. They are exceedingly effective in the shrubbery during the Winter months when color is most needed. They delight in plenty of water during the growing season.

They make handsome veranda plants, grown in large pots or boxes, especially when in fruit. There are several varieties with variegated foliage such as picta alba variegata, bicolor and aurea.

To insure a good supply of the very ornamental berries, which are produced on the female plant only, hand fertilizing

may be necessary. The time for applying the pollen is when the pistil exudes a slightly gummy substance. Should the pollen be ripe before the pistil is mature, it may be preserved by being collected on a piece of dry paper and kept in a dry place. It should be applied with a camel's hair brush. The pollen retains its power for two weeks or perhaps a little longer. Any well-drained garden soil suits the Aucuba, and any situation not in the glaring hot sun. It does remarkably well even in the dust and smoke of the city.

Propagate by cuttings from short-jointed half-ripe wood placed in sandy soil in a cool frame in September; shade during sunshine for the first two weeks. It can also be propagated by sowing the seeds one-quarter of an inch deep as soon as ripe or in March. Remove the fleshy coating from the seeds before sowing.

Azalea

A genus of evergreen or deciduous flowering shrubs which should be seen in every collection as they are all free-flowering and of good habit of growth. They delight in a half-shady situation, protected from harsh winds and strong sunshine, and away from cold draughts. They prefer a light sandy soil and abundance of water within reach of their roots.

Azalea.

Propagate by cuttings of half-ripe wood taken off with a heel in June or July; insert them in pots filled with soil composed of half silver-sand, half leaf-mold well mixed together; place them in

a cool frame, and shade during sunshine, until rooted. When rooted, plant them in small pots and return them to the frame; shade them until they form fresh roots when they should be placed in a shady spot out of doors or preferably in a lath-house, the object being to keep the plants as cool as possible.

The evergreen species seem to do best when grown in pots in a lath-house or under the shade of a deciduous tree, being brought into the greenhouse only during the season of flowering which is in late Winter and early Spring. As soon as they finish flowering, the seed-pods should be picked off and the plants returned to the lath-house so as to make their young growth. As their roots are very fine, the soil should never be allowed to become dry. The deciduous species are best grown in the open border partially shaded by deciduous trees.

Azara microphylla

A showy evergreen shrub with small box-like foliage and of graceful habit of growth, bearing fragrant flowers succeeded by orange-colored berries. Being a native of Chile, it is well adapted to our climate.

Propagate by cuttings of firm wood of present season's growth, placed in sand, in cold frame in September or early in October.

Banksia

The Banksia is a very desirable class of small trees or shrubs, native of Australia. It has handsome serrated leaves (covered with white down) and brilliant masses of feathery-looking flowers making a pleasing effect in the garden or shrubbery.

In Australia the Banksia is known as the Scrub Honeysuckle from the fact that when the cylindrical-shaped flowers are in full bloom they contain a sweet honey-like liquid.

The genus contains many varieties and grows in any soil well drained even if it be the poorest sand.

Propagate by seeds, which should be sown as soon as received, in soil composed of half sand and half leaf-mold; cover the seeds one-quarter of an inch deep and place them in a cold frame. When the seedlings are one inch high, pot them singly in two-inch pots.

Benthamia

A hardy evergreen small tree or shrub, native of Japan and South Africa, bearing white cornus-like flowers which continue in bloom for nearly two months. The reddish strawberry-like fruit hangs on the tree late into the winter, making the plant a very desirable one for the shrubbery border.

The Benthamia is not particular as to soil and requires very little irrigation.

Propagate by seeds sown in early Spring, in the open border or in a cold frame, in light soil. The seeds should be covered to the depth of one-quarter of an inch and the young plants should be transplanted when they are a year old.

Berberis (*Barberry*)

The Berberis is a genus of shrubs of which many varieties have handsome shiny compound leaves while the leaves of others are small, round, oval or holly-like.

Berberis Aquifolium, one of the favorite varieties, is a native of California and Oregon. It delights in a shady hillside, making a very good undergrowth.

Berberis Darwinii is a beautiful Winter-blooming plant. It forms a dense bush, and, when covered with its bright orange-colored flowers, makes a striking effect.

Berberis nepalensis also has yellow flowers and compound

leaves with from six to ten pairs of leaflets of a rich holly-green; it bears large clusters of purple berries during the Winter months. It should be planted in a shady spot protected from drying winds.

Berberis japonica is another of the Nepaul type with compound leaves and purple fruit. Other desirable kinds are Berberis stenophylla, Berberis buxifolia and Berberis loxensis.

Propagate by seeds sown about one-eighth of an inch deep as soon as ripe, or by layers, suckers or cuttings put in sandy soil the end of September or early in October.

Betula alba (*Birch*)

The Birch is a highly ornamental deciduous tree of graceful (sometimes drooping) habit, bearing light-green leaves. All of the species are hardy and will grow freely in any well-drained soil, provided they get abundance of water at the roots. A situation on or about a well-kept lawn suits the Birch admirably if it is sheltered from harsh winds. Fine effects are produced by combining the Birch with the Bamboo, as, when planted in group form, their habits of growth blend excellently.

Propagate by seeds which should be sown, as soon as ripe, in a shady border in light sandy soil; barely cover the seeds with the soil. The seedlings should be transplanted, when a year old, into nursery rows.

Bouvardia.

Bouvardia

The Bouvardia is a very useful Fall-flowering little shrub with opposite leaves and tubular-shaped fragrant flowers, a native of Mexico and

Texas. Bouvardia augustifolia, Bouvardia scabra and Bouvardia jasminiflora are among the best for outdoor culture.

Propagate by cuttings put in a cold frame early in August, using half-ripe wood, or in the open ground, in November, in sandy soil, using firm ripe wood, the cuttings to be about six inches in length, of the previous season's growth and planted four inches deep.

Buxus (*The Tree Boxwood*)

This is an excellent shrub for the coast counties, being evergreen and of a dense habit; it requires no pruning. Slow of growth and always clear of dust, it gets along with little water and thrives in any garden soil, while it is also a good box-plant for verandas, etc.

Buxus.

Some very good varieties have been introduced from Japan, several of them with larger leaves and more vigorous habit of growth than any of the European species, one of these being Buxus japonica, which grows to the height of ten feet, while Buxus japonica variety microphylla has very small leaves, grows rather conical in shape and forms a dense bush.

Buxus longifolia (a native of Northern India) has narrow elliptic-shaped leaves. Buxus balearica is the largest of the genus, has yellowish-green leaves and, in good soil, grows to the height of thirty feet. Buxus suffruticosa, the dwarf species, is much used in formal gardening, in making edges to footpath and flower-beds, and in bordering walks in vegetable gardens.

Propagate by cuttings six inches long, inserted four inches in sandy soil at any time between September and February.

When the cuttings are of the dwarf variety, for an edging or border, they should be planted singly about one inch apart.

Callistemon

A genus of very pretty Summer and Fall-flowering shrubs with narrow pointed leaves and showy flowers. All are graceful in habit and grow well in any fair garden soil where they require very little attention if the ground is cultivated once a year and kept loose on the surface and clear of weeds.

Callistemon.

There are several species, all natives of Australia.

Propagate by seeds sown one-eighth of an inch deep in April. When the seedlings are three inches high, pot them singly in three-inch pots or plant them in light sandy soil, three inches apart, in boxes; keep the young plants in pots or boxes until the following Spring when they will be large enough to be planted in the open ground in nursery rows or in their permanent quarters.

Calycanthus (*Carolina Allspice*)

The Calycanthus is a handsome deciduous shrub with sweet-scented red or yellow-brown flowers, native of this State, the Southern States and Japan.

It grows in any good soil which is well drained, and prefers a sheltered situation.

Propagate by sowing the seeds during Spring in a cold frame, covering the seeds to the depth of one-quarter of an inch; also by division of the roots of the older plants in Winter or early Spring.

Camellia

A genus of hardy evergreen trees or shrubs of elegant habit, bearing gorgeous vari-colored flowers. Some are single, many are semi-double, and hundreds of varieties have double flowers in all shades of red, pink, and white or beautifully mottled or striped. With a good well-selected variety, they may be had in bloom for four or five months beginning in January.

Camellia.

The Camellia loves a partially shaded situation away from cold winds, good, deep sandy soil and plenty of water during the Summer months.

Propagate by cuttings in September, or by layering in the usual manner in June and July, or by seeds sown one-quarter of an inch deep as soon as delivered or in the early Spring.

Caragana

Hardy deciduous ornamental trees and shrubs with pinnate leaves and pea-shaped flowers, mostly natives of Siberia and Northern China. They grow in any garden soil.

Propagate by cuttings of the roots or by layers between November and February, or by seeds sown in Spring. Cover the seeds to the depth of one-eighth of an inch.

Carpinus Betulus (*Hornbean*)

A hardy deciduous tree with simple leaves and flowers in catkins. It stands exposure well, grows in any soil, and should make a good street tree where deciduous low-growing trees are preferred.

It also forms a very good hedge and stands clipping well. As the leaves remain on the branches throughout the Winter, it becomes an excellent shelter, standing the winds and storms better than most deciduous trees.

Propagate by seeds sown, in early Spring, one-quarter of an inch deep in the open ground; transplant the seedlings to the nursery row when they are one year old. If they are wanted for hedge purposes, they should be cut back to six inches when transplanted so as to make them branch closely to the ground.

Carya

A handsome, slow-growing tree with pinnate, walnut-like, light-green, deciduous leaves. It is of a spreading habit and delights in good, rich, bottom soil and a sheltered situation. The wood is heavy, hard, tough and strong. The nuts of many species such as the pecan and the shagbark are of good flavor and are produced in large quantities on the older trees. Any one having a piece of land by the side of a creek, where the soil is deep and rich and the situation well-sheltered, should plant a few Hickories.

Carya alba (the Shell-bark Hickory) makes a grand specimen from sixty to seventy feet high.

Carya olivæformis (the Pecan-nut tree) also becomes a splendid tree. It differs in habit from the Hickory, being more upright in its form and having from twelve to fifteen leaflets on each leaf.

Propagate by seeds planted in Fall or Winter one inch deep where they are intended to remain permanently.

Cassia

This is one of the most common of our California garden shrubs, giving a fine show of pea-shaped yellow flowers in Winter. It has pinnate leaves and grows from six to twelve feet in height. It should be pruned back each Spring so that the plant will keep in shape and make strong shoots. It flowers most freely on the previous year's wood. It thrives in any garden soil and requires no artificial irrigation if the ground is kept cultivated and clear of weeds.

Cassia.

There are several varieties of this popular shrub including Cassia corymbosa, Cassia marilandica, Cassia Sophera, etc., all being of easy culture.

Propagate by seeds sown one-eighth of an inch deep in a cold frame in early Spring; when the young seedlings are three inches high, they should be potted or planted either in boxes or in the open ground.

Castanea (*Chestnut*)

The sweet or Spanish Chestnut is a large spreading deciduous tree of good habit and very ornamental. It delights in a sheltered situation and should have deep, well-drained, sandy loam. Never plant it in a cold clay subsoil.

Propagate by seeds sown one inch deep in the open ground, between November and February. The following Spring transplant the seedlings into nursery rows, one foot apart between the plants and two feet between the rows.

Casuarina (*She-Oak*)

The Casuarinas are a genus of jointed leafless trees which have a very distinct and peculiar effect in any landscape, their long, drooping feather-like habit being quite different from that of any other tree. They reach a height of from sixty to eighty feet, are evergreen, grow in any soil, stand exposure well and should be planted more commonly than they are.

Casuarina.

Propagate by cuttings put into a cold frame in the Fall and potted off in Spring or as soon as they are well-rooted; also by seeds sown in Spring. Cover the seeds to the depth of one-eighth of an inch.

Ceanothus (*California Lilac*)

This elegant native of our hillsides deserves more attention from planters than it now receives, few flowering-shrubs equalling it for grouping in large grounds or as single plants in small gardens. Its graceful habit of growth, its deep-green leaves, and its showers of blue or white panicles of sweet-scented blossoms make it effective in any garden. Its culture is very simple as it seems to thrive and bloom in the poorest soils and in all aspects.

Ceanothus.

Propagate by sowing the

seeds one-sixteenth of an inch deep, in the open ground in early Spring, and transplanting, where required, the following season.

Cedrus

A majestic evergreen coniferous tree with large spreading branches. It delights in a deep well-drained gravelly loam and a sheltered situation where it grows to the height of from eighty to one hundred feet.

Cedrus Libani. Young Specimen.

Cedrus Libani (the Cedar of Lebanon) is of similar habit to our Monterey Cypress, both as a young tree (when its habit is pyramidal) and as a full-grown specimen when it assumes the picturesque spreading form with horizontal branches and broad flat head of dark mossy-green foliage which is so greatly admired.

Cedrus atlantica (from Mount Atlas) is very similar in appearance to Cedrus Libani, being, however, more pyramidal in habit and having a lighter, more glaucous-colored leaf. Cedrus atlantica glauca, a silvery-leafed form of Cedrus atlantica, is a most desirable variety on account of its striking, silvery-grey effect when planted among trees which have dark-green foliage.

Cedrus Deodara (the East Indian Cedar) becomes a much larger tree than any other of the species, growing, under favorable conditions, to the height of two hundred feet and having a stem over ten feet in diameter. When young it is a gracefully pyramidal tree, densely set with leaves of a glaucous green.

Propagate by seeds sown one-eighth of an inch deep, in Spring or as soon as ripe.

Cerasus

A genus of hardy deciduous or evergreen trees or shrubs, many species of which are highly ornamental, our native evergreen species being in many respects the most handsome of all. Its shiny dark-green, holly-like leaves and bushy habit make it a general favorite with planters. It grows freely in any garden soil which is well-drained, preferring a loose rocky soil with an Eastern exposure. The so-called English Laurel and the Portugal species are also much admired, and the Chinese double-flowering deciduous species is one of our gayest Spring-flowering shrubs.

Portugal Laurel

Our native species Cerasus ilicifolia is propagated by seeds sown one-half of an inch deep, in early Spring, either where they are to remain, or singly in pots where they should be kept until they are from twelve to eighteen inches high.

The English Laurel and the Portugal Laurel may be propagated by seeds sown, one-quarter of an inch deep, in the open ground in early Spring, or by cuttings planted in October in sandy soil in the open ground where they should be kept for one year and then replanted in nursery rows until required.

Cerasus serrulata and other double-flowering varieties are propagated by budding on the common Cherry about May.

Cercis (*Judas tree*)

An ornamental, hardy, deciduous low-growing tree with heart-shaped leaves and pea-shaped flowers which thickly crowd the branches, flowering before the leaves open. When in bloom in early Spring it gives a very good effect. It grows in the foothills of the State by the side of a creek, mixing very prettily with the Alder and the Willow, and, when in flower, may be seen for miles, causing the traveller to wonder what the striking object is. It delights in rich, moist, well-drained soil in a semi-shaded situation away from the wind. It is propagated by seeds sown, in early Spring, one-quarter of an inch deep in the open ground.

Cercis.

Cestrum

An evergreen shrub of upright habit and variously-colored flowers in cymes or fascicles blooming in Winter or early Spring. It should have a well-sheltered position and does best in light sandy soil, not being hardy where the temperature falls below twenty-six degrees Fahrenheit. The best known species are Cestrum elegans (purplish-red), Cestrum fasciculatum and Cestrum aurantiacum (yellow), all natives of Mexico.

Propagate by cuttings placed in cold frame, in soil composed of half sand and half leaf-mold, in September; shade from the sun until rooted.

Cestrum.

Choisya ternata

One of our best Winter-blooming shrubs, having ternate leaves and white sweet-scented flowers. It should have a place even in the smallest collection, being of dwarf bushy habit and very free-flowering. It grows in any good garden soil.

Propagate by cuttings put into half sand half leaf-soil in a cold frame in early May or as soon as the blooming season is over or in August after the young wood is half-ripe.

Choisya ternata.

Cistus (*Rock-Rose*)

A genus of elegant free-flowering small shrubs with a large handsome flower resembling a single rose. This charming genus has a large number of species which should be more commonly seen in our gardens as they are of easy culture and require little water for their development. Being natives of the coast of the Mediterranean, they are peculiarly adapted to introduction into California.

Cistus.

They are propagated by seeds sown under glass in Spring (the seeds being barely covered by finely-sifted, sandy soil), or by cuttings of young

wood, three or four inches long, placed in soil composed of one-half sand, one-half leaf-mold, in a cold frame, either in Spring or Fall; as soon as they are rooted, pot them into three-inch pots in soil composed of two-thirds leaf-soil and one-third sand with the addition of a little loam.

Citrus Aurantium (*Orange*)

The Orange as a decorative garden tree is not so well known as the Orange grown as a fruit tree. It forms, however, most charming effects in the landscape when planted either in group form or as single specimens on the lawn, especially if grown in tree form with a stem of from six to eight feet and a spread of branch, fifteen or more feet across, covered densely with its great masses of bright evergreen foliage and its beautiful, fragrant, white flowers which are nearly always in bloom. It also is unexcelled as a winter garden ornament when laden with its golden fruit. There are many highly ornamental species, including Citrus Aurantium (the Sweet Orange) a native of Asia, Citrus decumana (the Shaddock) with fruit from six to eight inches in diameter, Citrus japonica which makes a very pretty bush, Citrus Limetta (the Lime), Citrus Limonum (Lemon), Citrus nobilis (Mandarin), Citrus trifoliata (with its prickly stems and small ornamental fruit) which makes a handsome bush and is also a good hedge plant, and Citrus vulgaris (Bitter Orange) which grows to the height of forty feet and is a handsome tree.

Propagate by seeds, sown one-quarter of an inch deep under glass. Transplant the seedlings, when three inches high, into nursery rows; keep them in the nursery until they are from four to six feet high and then plant them in their permanent quarters. The finer varieties may be increased by budding on the common stock.

Clethra

Evergreen and deciduous small trees or shrubs, valuable on account of their showy spikes of fragrant white flowers which appear late in summer. The evergreen species (such as Clethra arborea) are noted for the laurel effect which their large, glossy leaves give. They thrive under our California conditions. Clethra arborea (a native of Madeira) is perhaps the finest of the species. Clethra quercifolia does exceedingly well in the warmer sections of the state.

Propagate by seeds sown in early Spring in a cool greenhouse temperature (covering the seeds to the depth of an eighth of an inch), or by cuttings in sandy leaf-mold placed in a cold frame during September.

The Clethra flourishes in any fair garden soil.

Clianthus

A genus of about three species of hardy evergreen shrubs, natives of New Zealand and Australia. They have compound leaves and bear great masses of brilliant scarlet pea-shaped blossoms, continuing in bloom for several months. Clianthus puniceus is the hardiest of the genus and is of the most easy culture, growing freely in any soil of a sandy nature either in the open or in partial shade.

Clianthus puniceus.

Propagate by cuttings of half-ripe wood inserted in a cold frame in March and shaded from hot sunshine until rooted when they should be potted singly in three-inch pots and grown on until required.

Coprosma (*New Zealand Holly*)

A genus of handsomely-leaved evergreen shrubs which should be in every collection. They grow freely in any situation (even in the smoky city garden), their glossy holly-green leaves refusing to carry any dust. They contrast well with our rough-leaved shrubs.

The genus comprises over thirty species, mostly natives of New Zealand and other Pacific Islands. Coprosma Baueri and its varieties are the best for cultivation on the Pacific Coast. Coprosma picturata and Coprosma variegata, being variegated forms of Coprosma Baueri, are very attractive.

This shrub is not so easily propagated as most of our other free-flowering shrubs, and should be given extra care in being shaded from hot sun. In making the cuttings, slit the lower end to the depth of three-quarters of an inch; insert them in soil composed of two-thirds clear sand and one-third well-decomposed leaf-mold in a cold frame in September. Do not overwater them. As soon as rooted, they should be potted off in thumb pots, put back into the cutting frame and kept close and shaded until they take fresh roots. Propagation may also be effected by seeds sown one-eighth of an inch deep in light sandy soil in Spring.

Cornus (*Dogwood*)

The Dogwood is one of the most attractive of our ornamental deciduous shrubs, delighting in semi-shaded moist places protected from winds, and thriving best in light rich soil. One of our native species, Cornus Nuttallii, is the finest of the genus, growing in favorable situations to a height of from sixty to eighty feet, pyramidal in habit, and, in early May when entirely covered with its great white bracts, is the most conspicuous and attractive object in the mountains and foothills. In the Fall, when laden with its orange-colored

fruit, it gives good effects in the shrubbery. All of the species are very desirable, especially Cornus sanguinea and Cornus florida, these making good undergrowth even in the darkest shade.

Propagate by cuttings placed in sandy soil in a shaded protected border out of doors after the leaves fall in Autumn. They may also be increased by division of the roots in Winter or early Spring, by seeds sown in Spring and by layering in June. Cover the seeds to the depth of one-eighth of an inch.

Coronilla

Very pretty small-growing ornamental shrubs and perennial herbs of easy culture and graceful habit, having glaucous and variegated leaves. They are well adapted to planting on the margin of shrubbery groups

Propagate by cuttings placed in sand in a cold frame early in September; leave them in the frame all Winter and pot them off in Spring in pots of light rich soil; grow them in pots for a year and then plant them in their permanent situations.

Corynocarpus

Handsome evergreen trees, native of New Zealand, with laurel-like leaves and pyramidal habit, bearing white flowers and plum-like fruit. No evergreen tree or shrub gives a better effect in large shrubberies than the Corynocarpus and it should be found in even the most choice collection.

Propagate, at any time from June to September, by cuttings taken from half-ripe wood; place them in a cold frame shaded from sun, and, when rooted, pot them in three-inch pots; plant them in the open ground the following Spring.

Cotoneaster

A genus of hardy evergreen shrubs with small boxwood-like leaves and small white flowers, bearing abundant crops of bright-red berries which remain conspicuous for months. It begins to ripen in California in July carrying its fruit until the following Spring.

Cotoneaster.

Propagate by seeds, cuttings or layers in the open ground; sow the seeds one-eighth of an inch deep in March; put in the cuttings or layers any time during the Fall. It is of easy culture, requiring very little attention beyond being given a little water during the Summer months.

Crataegus (*Hawthorn*)

A genus of hardy shrubs and small trees with single leaves and great sprays of sweet-scented pretty flowers. No hardy flowering tree gives finer color effects in the landscape than the Hawthorn, whether planted in groups or grown as single specimens. The Hawthorn prefers a good stiff loam or clayey soil, and, if the soil is kept well cultivated, no artificial irrigation will be required after the first year.

Propagate by seeds sown in the Fall, or as soon as the pulpy matter can be rotted from the seed; cover to the depth of half an inch and transplant the following Winter into nursery rows. The red-flowering and double white varieties are propagated by budding in May or by grafting in Winter on the common species in the usual manner. It should be noted that while some seeds germinate the first season, others may not germinate until the second year.

Cupressus nootkatensis, the Alaskan species.

Cryptomeria

A genus comprising only two species, both indigenous to Japan. They prefer a rich, moist, well-sheltered situation and abundance of water during the Summer months, when they form elegant specimens of pyramidal habit.

Propagate by seeds sown one-eighth of an inch deep in a cold frame in Spring. When they are four inches high, plant them in nursery rows (giving room as required) where they may remain until wanted.

Cupressus (*Cypress*)

The Monterey Cypress is a universal favorite, nearly every garden having a representative of this species. It makes an excellent wind-break and stands exposure as well as, if not better than, any tree we have experimented with whether indigenous or exotic. It is of vigorous habit and assumes stately proportions. When full grown and when its massive flat crown is well-formed, no tree has more character or more striking individuality. It grows well in any soil but prefers rich, well-drained loam.

Cupressus lawsoniana.

Cupressus lawsoniana is of more elegant form than the preceding, being of pyramidal habit and graceful outline. Cupressus sempervirens (the Italian Cypress) is of a tall tapering habit and formal appearance.

The Cypress makes an excellent hedge.

All of the species are easily propagated by seeds sown, in the early Spring, one-quarter of an inch deep, in boxes, and placed in a cold frame. When they are three inches high

transplant them into boxes (placing them three inches apart) and afterwards plant them out in nursery rows about one foot apart.

Cydonia japonica (*Japanese Quince*)

A genus of dwarf deciduous flowering shrubs, opening their flowers as early as the middle of January. There are several species all of which are very desirable, some having scarlet flowers, others bright pink, and one species (Cydonia japonica alba) bearing flowers of the purest white. They are all an easily grown, free-flowering class of plants which should be seen in every collection, as they thrive in any soil and require little attention.

They are propagated by layers in July, or by cuttings put in the ground in October.

Cytisus (*Broom*)

A genus of about forty species of shrubs bearing pea-shaped flowers in great abundance. They are of very easy culture, and, without irrigation, grow freely in any soil, even the poorest.

Broom.

Propagate by seeds sown one-quarter of an inch deep in the open ground or in a cold frame in early Spring. When the seedlings are four inches high, transplant them into nursery rows and grow them on until required. Cytisus racemosus and others of the class may also be increased by cuttings, placed in a cold frame in October, and shaded from sunshine until rooted, when they should be potted singly in small pots.

Daphne

A genus of very ornamental evergreen or deciduous shrubs, their sweet-scented flowers and compact habit of growth making them desirable for planting in our shrubberies.

They prefer a warm, sheltered situation, away from harsh winds and hot sunshine, and a soft brown soil with perfect drainage.

Propagate by cuttings placed, in September, in a cool frame and left there until calloused. They should then be placed in a gentle bottom heat when they will soon make root and be ready for potting in three-inch pots; give them root-room as required.

Datura (*Cornucopia flower*)

Herbs, shrubs or trees with large entire tongue-shaped leaves, bearing trumpet-shaped flowers sometimes over a foot long. The flowers are of various colors, including white, orange and red. Some varieties are very fragrant, especially at night. They grow well in any good garden soil with ordinary care.

Datura suaveolens.

The best kinds are Datura sanguinea, Datura arborea, Datura suaveolens and Datura cornigera.

Propagate by cuttings of half-ripe wood placed in sandy soil in a cold frame in October; as soon as they are rooted, plant them in pots, and, in early Spring, plant them in the open ground.

Deutzia

A genus of hardy, deciduous, strong-growing shrubs of easy culture, which, on account of their free-flowering qualities should have a place in every garden however small. They thrive in almost any soil, and well repay the trouble incurred in their cultivation.

Deutzia crenata grows to a height of about ten feet; Deutzia gracilis has a dwarf compact habit and should be planted on the margin of a group of taller shrubs, where it will give a fine finish to the group.

Propagate by cuttings of the ripe wood placed in the open ground in November; when they are rooted run them into nursery rows; give them room as required.

Diervilla or Weigela

A genus of hardy ornamental low-growing deciduous shrubs, mostly natives of China and Japan. No shrubbery is complete without a collection of these elegant free-flowering shrubs. They grow well in any garden soil and repay the attention bestowed on them. They bloom in early Spring and continue in bloom for a good length of time. As soon as the plants are finished blooming, prune the previous year's growth back to within six inches of its growth, so as to encourage the plants to throw out strong shoots, the best flowers always being found on the growth of the previous year.

Propagate by cuttings (made of the previous Summer's growth) about six inches long placed in sandy soil in the open ground in November or as soon as the leaves are all off. In the Spring, as soon as the cuttings are well rooted, plant them in nursery rows for a year when they may be transplanted into their place in the shrubbery.

Diosma (*Breath of Heaven*)

A genus of heath-like graceful shrubs with grass-like leaves and crowds of delicate white flowers. On account of its exquisite fragrance and delicate foliage this plant is much used in decorating and filling vases. It delights in a light, sandy soil and plenty of water. As it is rather a dwarf grower, it should be planted near the walks or on the edges of shrub-groups, for if planted among strong-growing shrubs it is apt to get lost or grown over.

Propagate by cuttings placed in a propagating house in gentle heat at any time between April and September; after they are rooted, pot them singly in thumb pots, giving them larger pots as required and using leafy sandy soil.

Duranta Plumieri

A South American shrub with blue or white flowers in ternate racemes. If given a warm sheltered situation in the full sun it does well and is very attractive.

Propagate by cuttings in Fall or Spring.

Echium (*Viper's Bugloss*)

A group of shrubby or herbaceous plants with large tongue-shaped leaves of a glaucous color thickly covered with fine hairs. They bear immense spikes of blue, pink or white flowers, forming very striking objects in the shrubbery, their large gray leaves effectively contrasting with their bright-blue flowers. They grow well in any good garden soil.

Echium.

Propagate by seeds sown one-sixteenth of an inch deep in the early Spring, or by cuttings placed in sand in a cold frame in October or November; grow them in pots

for one year and plant them in the shrubbery the following Spring.

ELÆAGNUS (*Wild Olive*)

A small genus of evergreen or deciduous shrubs of easy growth and attractive appearance, their glaucous downy leaves giving a soft effect when well placed in the landscape. The flowers are inconspicuous, their chief attraction being their leaves and fruit and also their graceful habit of growth. They do best in light sandy soil.

Propagate by seeds or cuttings placed, in October, in the open ground in sandy soil. Cover the seeds to the depth of one-eighth of an inch.

ERICA (*Heath*)

A most extensive genus comprising over four hundred species, all hardy in California, most of them being natives of the Cape of Good Hope and the Australian group. They ought to be seen in gardens more commonly than they are, as many of them are very easily grown and blossom in Winter and early Spring when flowers are scarce. They are among the most attractive of our flowering shrubs, and, as they are generally slow-growing and of neat habit, are well adapted for small gardens. All the care necessary is to give them a sandy soil, plenty of water, and a prune back immediately after flowering so as to encourage the forming of young growth on which they will flower the following season.

Erica persoluta alba.

In Europe and the East great care and considerable skill are thought necessary to grow these plants successfully. There they must be grown in pots, in specially prepared soil,

in greenhouses and watered carefully. Even with the best of care however they often there die off suddenly or are attacked by mildew, etc., and thrown into poor health, whereas here they seem to grow without any special care, giving grand results.

The best for every-day culture are Erica persoluta, Erica gracilis, Erica hyemalis, Erica melanthera, Erica Willmoreana, Erica arborea, Erica ventricosa, Erica capitata, Erica hybrida, Erica mediterranea and their varieties.

Propagate by cuttings placed in a cool frame late in the Fall, October or early in November being the best season; shade them from bright sunshine; pot them off as soon as rooted, in thumb pots, in sandy, leafy soil.

Erythrina (*Coral tree*)

A genus of plants with trifoliate leaves and pea-shaped flowers mostly dark-red in color (the individual flowers being of large size and generally in large clusters) forming very striking objects in the garden or pleasure-ground. They delight in good heavy loam and plenty of water during the Summer months, and revel in our hottest sun. They do well nearly all over the State excepting close to the coast where the cool fogs of Summer are not agreeable to their sun-loving nature.

The tree species, Erythrina humeana, grows to the height of from forty to sixty feet. It is a native of South Africa.

Erythrina indica is another of the family which ought to do better in California than experiments so far have shown. It grows to the height of about thirty feet and is a free bloomer, having great masses of pea-shaped brilliant scarlet flowers.

These have several varieties which should be placed in warm, sheltered spots in our gardens.

Propagate by seeds sown in early Spring one-eighth of an inch deep in hot-bed; plant in permanent quarters the following May or early June.

Escallonia

The Escallonias may be classed among our most useful shrubs, doing well however situated either as regards soil or exposure. They are natives of the cooler countries of South America, principally Chile and Patagonia. They all are evergreen and free-growing, so make excellent hedges, besides being very good plants for heavy grouping. Another good quality is their habit of blooming late in the Fall and early Winter, when color is scarce, the Escallonia montevidensis with its great bundles of terminal white blossoms having a very striking effect in November and December. The red-flowering Escallonia rubra and pink-flowering Escallonia rosea, the flowers of which contrast finely with the glossy green of the leaves, are much admired by lovers of fine shrubs.

Escallonia rosea.

There are about thirty-five species of this interesting family, all of them hardy, standing well the strongest winds and thriving even close to the ocean if not too near the salt spray. They make splendid pillar plants for the terrace or formal garden.

They stand pruning and are easily transplanted at almost any season. All the preparation necessary is to cut the plant well back, pruning off the small limbs and leaves so that only the larger branches remain. The roots should be dug up without any soil attached and, after being planted, the plant should be given a good watering. In a few weeks it will show new growth.

Propagate by cuttings put in sandy leaf-mold in a cold

Eucalyptus ficifolia.

frame in October; the following Spring plant them out in nursery rows until large enough to be planted in their permanent quarters.

Eucalyptus (*Australian Gum*)

This genus is one of the most useful of our introduced exotics. True, it is sometimes found to be a nuisance, especially when the common Blue Gum has been planted in good soil along narrow streets and its roots have been within reach of a poorly laid sewer, for it will find out poor work more quickly than most sewer inspectors, the tiniest crack or the smallest pinhole being surely discovered by the roots of this rampant gross feeder. Should a pin-hole be left in the sewer pipe, the Eucalyptus quickly enters and in a very short time fills the pipe so full of roots, that it stops up the entire pipe, sometimes for the distance of a hundred feet. This is not the situation for a Eucalyptus of thel Globulus variety, but the tree merits a place in the landscape and that place should be a prominent one. In an out of the way corner which cannot be used for any other crop, or, on some high knoll where shelter is needed and little else will grow, Eucalyptus Globulus (Blue Gum) can be planted to advantage, but there are many other species which may be introduced and which give fine effects even in the most choice collections.

For instance take Eucalyptus piperita: when grown in a suitable place it is as graceful as the Birch; and no Willow has a finer drooping effect than Eucalyptus saligna with its willow-shaped leaves; or again, the red-flowering variety (Eucalyptus leucoxylon, var. macrocarpa), when laden with its bright-pink, myrtle-like blossoms has a most striking effect in the landscape, while the scarlet-blooming Eucalyptus ficifolia is very effective even in small gardens as are also Eucalyptus cornuta (yellow flowered), Eucalyptus tetragona (crimson-flowered and a dwarf grower), and Eucalyptus Landsdowniana (also a dwarf grower with small red flowers and rather broad dark-green leaves). Still another

dwarf grower of bushy habit is the Eucalyptus pyriformis so named on account of the pea shape of the calyx; this species has pink flowers and is said to grow in the poorest lands such as in the dryest regions of South Australia. Eucalyptus corymbosa and its varieties give graceful foliage effects where room can be spared for them. Eucalyptus viminalis is a species which is almost indispensable where trees of a graceful or semi-drooping habit of growth are desired. Where the rainfall is light and a symmetrical well-balanced top is desired, the Eucalyptus corynocalyx can be safely recommended as it has been proven beyond a doubt to survive our dryest seasons, even when most of the strong vigorous growers, like Eucalyptus Globulus and Eucalyptus amygdalina, have died off for lack of sufficient moisture. Eucalyptus amygdalina is said to be the tallest-growing tree in the world, attaining, in the valleys of its native country, to the height of between five hundred and six hundred feet; it has rather dense foliage and a bright-green leaf. Eucalyptus sideroxylon (the iron bark) is one of the most desirable for planting in our interior valleys as it stands drought well; it is best known by its dark-brown iron-like persistent bark, red flowers and light-grey foliage; planted in group-form it gives a most striking effect in the landscape.

There is a great variety of this family of Australian trees, and, where space can be secured or spared, that space can be profitably used for planting the different species of this very ornamental and useful genus.

Propagation is by seeds. Sow the seeds in boxes or pots filled with light sandy soil, in March, or early in April; cover the seeds lightly with sandy leaf-mold and water thoroughly. Place in a cold frame and shade lightly during hot sunshine until the seeds have germinated; as soon as they have made four leaflets, remove the sash from the frame and replace it with a lathed cover to protect the seedlings from strong sunshine and also from the ravages of birds. When the plants are two inches high, transplant them into boxes about four

and one-half inches deep filled with good strong loam, planting them about three inches apart. Return them to a situation similar to the one from which they were taken; give them a good watering and keep them shaded during strong sunshine for a few days, afterwards gradually exposing them to the open air. Plant them, in March or April, where they are to remain.

Eugenia

The Eugenias belong to the Myrtle family and are very desirable shrubs or small trees, growing to the height of from twenty - five to thirty feet. They have a handsome pyramidal habit of growth, their myrtle-like leaves being tinted with pink in their growing state. They give a very good effect in the shrubbery, and, when covered with their white myrtle-like flowers, or later with their reddish globular-shaped fruit, make handsome ornaments in our grounds. Eugenia myrtifolia and Eugenia Smithii (or Eugenia latifolia as it is sometimes named) are the best varieties for this coast.

Eugenia latifolia.

Propagate by cuttings placed in sandy soil in a cold frame, in October, or by seeds sown in early Spring, also in a cold frame. Cover the seeds to the depth of one-sixteenth of an inch.

Euonymus (*Spindle-tree*)

A genus of evergreen or deciduous trees and shrubs, natives of Europe, Asia, Japan and the United States, with opposite leaves and small inconspicuous flowers. All are hardy in California and of easy growth, standing the harsh

winds of the coast counties very well and enduring rough treatment of every kind better than most of our common shrubs do. Some of the variegated kinds are considered to be among our most ornamental shrubs.

Euonymus grandiflorus grows to the height of twenty feet.

Euonymus japonicus is the most attractive of the species, being smooth-leaved, of good habit and carrying no dust, with small white flowers, and is also very handsome in the Fall and Winter when covered with its bright-red berries. It is exceedingly effective when grouped about the margins of the lawn or as a background for more delicate shrubs, also when massed with Laurel, Pittosporum, Veronica and others. There are many varieties of this useful and ornamental shrub. Euonymus japonicus aureus, Euonymus japonicus argenteus and Euonymus japonicus Duc de Anjou are all very desirable.

Euonymus latifolius, the broad-leaved Euonymus, is another of the type which should be in every collection as should also be its varieties with their gold or silver variegated leaves.

Propagate by cuttings of the last season's growth inserted, in October, in sandy soil, or by seeds sown one-eighth of an inch deep in early Spring; in either case place in a cold frame.

Exochorda

This shrub is a native of North China, belonging to the Spiræas, and is sometimes named Spiræa grandiflora. Its habit of growth resembles the Philadelphus and it should group well with the members of that family. It opens its handsome white clusters early in June, remaining in flower about one month.

Propagate by cuttings of the ripe wood placed in sandy soil in the open border in November, or by suckers formed at the base of the plants in Winter, or by layers in the Fall,

or by seeds sown one-eighth of an inch deep in the open ground as soon as ripe in the Fall.

Fabiana

An evergreen heath-like shrub of a stiff, erect habit of growth and bearing a profusion of small funnel-shaped flowers. It should be pruned back within a few inches of the previous year's growth as soon as the flowering season is over, this treatment insuring for the plant a much better shape than if it were allowed to take its natural habit of growth.

Propagate by cuttings of half-ripe wood placed in a cold frame in September or early in October or in early Spring before growth commences.

Fabiana.

Fagus sylvatica (*Beech*)

The Beech in the Eastern States and in Europe is a noble symmetrical tree requiring very little attention and growing in almost any soil which is well drained. Here in California it requires good shelter and a fairly good soil, well drained. It must have abundant moisture, doing well on the border of the lawn or close to a pond or water course.

There are several varieties, the purple-leaved variety appearing to be the best adapted to this climate. It is not advisable to attempt propagation in this State.

Fatsia

A genus of handsomely leaved plants belonging to the Aralia family, a name by which this genus is often known. They like a well-sheltered situation protected from strong

winds, where, if given good soil and plenty of moisture, they form handsome objects, their large palmated shining green leaves creating a fine tropical effect. Fatsia papyrifera produces the rice paper used in oriental countries for making artificial flowers.

Fatsia japonica and its variegated varieties are also very useful in tropical gardening, but as they are of slower growth and of dwarf habit should be planted near the margins of groups.

Another variety, Fatsia horrida, a native of the State of Washington, is of more spreading habit and has large palmated leaves three or more feet in width. Its stem is often too weak to sustain its large, heavy leaves and should be supported by a strong stake until its fourth or fifth year. This variety is thickly covered with stout sharp spines.

Propagate by cuttings of the root, an inch or more in length, placed in heat in early Spring, or by suckers growing from the base of the crown in Winter or early Spring.

Ficus (*Rubber tree*)

The fig family contains many highly ornamental evergreen and deciduous trees. Ficus elastica is a fine tree for the open ground and as a pot plant for the decoration of the parlor or sitting room, while, as a veranda plant, few are more hardy or give better satisfaction, its long leathery smooth shiny green leaves and upright stately habit making it a generally favorite plant for garden and indoor decoration. It grows well in any good garden soil provided it is given a sheltered spot and plenty of water.

Some fine specimens of Ficus are to be seen in Southern California and also in San Francisco, Oakland, San Rafael and San Mateo, a number of these being over forty feet high and generally enjoying vigorous health.

Propagate, in the early Spring, by cuttings taken from plants grown under glass; insert them in sandy soil in strong moist heat. If the cuttings are taken from the open

Ficus elastica.

ground, place them in a cold frame until they callous; they should then be taken from the cold frame and put in a house with a temperature of sixty degrees Fahrenheit where they will soon root.

Fraxinus (*Ash*)

The Ash is one of our favorite ornamental trees. It has long compound leaves and inconspicuous flowers; it loves good deep moist soil and a sheltered situation, the bank of a creek being its favorite haunt. The weeping varieties of Fraxinus excelsior make very handsome specimens for the lawn.

In the Fall, propagate by seeds sown as soon as ripe one-quarter of an inch deep in a sandy soil. When the young plants, in the early Spring, are from six to twelve inches high, plant them in nursery rows about six inches apart in the rows and with two feet between the rows. Replant them in their

Fraxinus excelsior.

permanent quarters when they are from four to six feet in height.

The weeping varieties are propagated by grafting on the common Ash in early Spring. To get good specimens they should be grafted on strong young saplings at a height of from twelve to twenty feet, thus having plenty of height so that the pendulous limbs may easily be spread out the required arbor width.

Gardenia

The Gardenia is a genus comprising many species, most of which are natives of Asia. All are evergreen small shrubs with sweet-scented white or yellow flowers, the single varieties having funnel - shaped flowers. The double-flowering varieties are, however, the most desirable, some of them being as double as a Camellia and bearing flowers which are four inches in diameter.

Gardenia.

The Gardenias should be planted in every garden, however small, as they form compact little bushes while their beautiful fragrant white flowers make a handsome decoration. The climate of Oakland and of the South as far as San Diego suits them admirably. They delight in a warm sheltered situation and plenty of water at the roots during Summer. Gardenia Fortunei and Gardenia radicans major are the varieties best suited to the conditions of California. Any good light loam, if well drained, will suffice them for soil purposes.

Propagate by cuttings of half-ripe wood placed in a cold frame, in August, in soil composed of half well-decomposed leaf-mold and half silver-sand. After putting in the cuttings, the frame should, for two weeks, be shaded during sunshine.

Genista

A large genus of free-flowering shrubs of compact, bushy habit, having flowers pea-shaped and mostly yellow in color, growing freely in any garden soil (preferably light and sandy) and requiring no artificial irrigation after the first year.

Propagate by seeds sown, in Spring, one-quarter of an inch deep in the open ground, or in boxes in cold frame; when the seedlings are from four to six inches high, prick them out in boxes or in the open ground. Plant them in permanent quarters when they are from twelve to eighteen inches high; water them during the first year after planting. All are worthy a place in the pleasure-ground.

Ginkgo (*Maidenhair-tree*)

The Maidenhair-tree is a native of North China and is named Maidenhair-tree from the form of its leaflets, these being shaped like the leaflets of the Adiantum fern. It has an upright open habit and has a distinctly handsome appearance in any landscape while it also makes a good street tree.

There are several handsome varieties including the deeply-cut leaved Ginkgo biloba laciniata and a weeping form, Ginkgo biloba pendula.

Propagate by seeds sown, as soon as ripe, one-quarter of an inch deep in the open ground. Plant them in permanent site, when they are from six to ten feet high, in good deep well-drained soil.

Gleditschia (*Honey Locust*)

A handsome spreading tree with pinnate and tripinnate leaves on the same plant, deciduous, light-green in color and of graceful habit, the branches being crowded (especially on the lower limbs) with strong sharp spines. Its seeds are in long fleshy pods about two inches in width by fifteen inches

in length, each pod containing a dozen seeds. The pulpy portion of the pod is sweet when fresh, hence the name, "Honey-Locust." It is a very desirable tree, growing in any ordinary good soil, and should make a good street tree, as, on account of its spine-covered branches, boys would fight shy of climbing its trunk.

There are several species of the genus all worthy of a place in the pleasure-ground. The Japanese and its varieties purpurea and coccinea, the Chinese, the water locust (Gleditschia aquatica) and several other kinds are all very desirable.

Propagate, by seeds, in January; as the shells of the seeds are exceedingly hard, soak them in hot water for a few hours before sowing. Plant the seeds about an inch deep in the open ground; leave them in the seed-bed for one year when they should be planted in nursery rows. Plant them in permanent quarters when they are from six to fifteen feet high.

Grevillea

A genus of elegant trees and shrubs mostly natives of the Australian group, many of the species having leaves as beautifully cut as a fern. According to Eastern and European authorities they grow only five or six feet high, whereas here in California they reach a height of from forty to fifty feet with a diameter of stem of over a foot. Grevillea robusta, the most commonly grown species, is very ornamental, and when in bloom is a striking object in the landscape with its great trusses of orange-red flowers set among its fern-like foliage. It grows freely in any ordinary good soil and requires very little water. Grevillea fasciculata, Grevillea juniperina, Grevillea thelemanniana, Grevillea saligna, the scarlet-blooming Grevillea punicea, and the purple-flowering Grevillea vestita should be seen in our gardens more frequently than they are and well repay any care and attention bestowed upon them.

Propagate by seeds sown, in Spring, one-quarter of an inch

deep in sandy soil in a warm greenhouse, or by cuttings planted, in September, in a cool frame shaded from strong sunshine; grow them in pots until they are required for planting in the open ground.

Gymnocladus (*Kentucky Coffee-tree*)

A lofty tree, native of the Eastern States from Kentucky to Canada, receiving its name from the seeds being used by early settlers as a substitute for coffee.

This tree is a favorite shade tree both in the East and in Europe and should thrive better here than it seems to have done in many places. It requires a shady sheltered situation and a soft, moist soil.

Propagate by seeds sown one-quarter of an inch deep in the open ground as soon as ripe in the Fall.

Hakea

A large Australian genus comprising many species with needle-like foliage and bottle-brush flowers. A few assume tree form but most of them are low-growing shrubs. All are attractive when in bloom, but, on account of their hard, needle-like leaves and persistent seed vessels, are not very desirable except in large collections.

Propagate by seeds sown one-sixteenth of an inch deep, in heat, in early Spring, or by cuttings of the ripe wood placed in a cold frame in September and potted as growth requires; keep them in pots until required for planting in permanent situations.

Halesia

A genus of pretty shrubs containing half a dozen species, natives of the Eastern States and Japan and one from China. The Japanese Halesia hispida does especially well, growing freely and blooming abundantly, its clusters of pure white

snowdrop-like flowers together with its semi-pendulous habit of growth making it a good addition to the shrubbery. The Halesias delight in a light rich sandy soil and a sheltered situation.

Propagate by layers in the open ground, and also by cuttings of the roots placed in a cold frame in September.

Hydrangea

Highly decorative, evergreen and deciduous shrubs. Hydrangea hortensis, the most easily grown of any of the species is a universal favorite, flowering, as it often does, ten months of the year, its handsome foliage and great trusses of pink, white or purple sterile flowers giving a fine effect. It does best in a semi-shaded situation in light sandy moist soil. If extra large panicles of flowers are desired, cut the shoots back to within a foot of the ground and thin the remainder of the flower stems to not over six, manure them heavily and water them freely; the result will be enormously large heads requiring stout stakes to support them. It also makes an excellent vase plant for the porch or veranda, the shade and shelter of the veranda being a very suitable light for its development.

Hydrangea paniculata is a valuable shrubby species for the decorating of the shrubbery, having smaller leaves than the preceding and panicles also smaller and of a more pointed shape. It requires a sunny warm situation and all the light possible.

There are many varieties of the hortensis, notably Dr. Hogg with pure white flowers, and hortensis japonica with blue flowers. Some have variegated foliage.

All are easily propagated by ordinary cuttings placed in sandy soil in a cool frame in October.

Hymenosporum flavum

This handsome evergreen tree is a native of Australia, has smooth glossy bright, light-green leaves and bears masses of

tubular-shaped yellow flowers which have a strong sweet odor scenting the atmosphere for an area of a hundred yards. It grows freely in any good garden soil and should be used extensively in planting large grounds.

Propagation is by cuttings placed in a cold frame, during October, in light sandy leaf-mold. It may also be propagated by seeds sown in Spring in a frame, the seeds to be covered to the depth of a quarter of an inch.

Hypericum

A genus of hardy, low-growing shrubs generally with yellow flowers, mostly natives of Southern Europe and the United States. All are of easy culture, growing freely in any good garden soil. Hypericum delights in a shady nook under the shelter of tall shrubs for which it makes an excellent undergrowth or carpet, thickly covering the surface of the ground with its foliage and bright-yellow flowers. There are many fine species, such as H. moserianum, H. Androsæmum, H. patulum, etc., well deserving a place in the shrubbery.

Hypericum.

Propagate by cuttings placed in a cold frame in Autumn; shade them for the first few days, and, when they are rooted, plant them in nursery rows until wanted.

Ilex (*Holly*)

A genus of one hundred and fifty species, evergreen and deciduous. It is highly ornamental, its stately habit of growth and its bright glossy green, undulate, prickly leaves

making it one of the most popular of shrubs. When covered with a heavy crop of its bright crimson berries, it is exceedingly effective in the garden from November to early Spring.

There are many varieties of the different species which are highly ornamental; some of them, with variegated leaves, should be in every collection, however small. The Holly stands pruning into almost any shape and makes an excellent hedge though of slow growth, it taking seven or eight years to grow a holly hedge five feet in height, but from its first appearance above ground it is pleasing and should be more frequently used for this purpose.

The Holly delights in a semi-shaded spot in a sheltered place, away from harsh winds and strong sunshine, and loves moisture at the root during the growing season.

Ilex opaca, the Southern Holly, ought to be seen more commonly than it is, and should stand our dry Summers much better than the European or Japanese species.

Propagate by seeds sown in the open ground. As soon as the seeds are ripe, place them in wet sand for the Winter, and, when the fleshy pulp is completely rotted, sow them in drills or beds and cover them with one-half inch of light soil; shade the young seedlings with branches for the first year; when the seedlings are four inches high, transplant them into nursery rows one foot apart; transplant them at least every two years until wanted. The variegated varieties can be propagated only by grafting. This should be done in early Spring before growth commences, using seedlings of the common Holly as a stock.

Indigofera

A genus of leguminous shrubs and herbs with purple, rose or white flowers, natives of Australia and the United States, and at least one species indigenous to California. They grow in sandy garden soil.

To get the best results, prune them back, in February, rather severely so as to encourage the forming of young wood on which the finest flowers are produced. Of the many species, australis, decora and tinctoria will be found the best for the Coast.

Propagate, in Spring, by seeds or cuttings. Cover the seeds to the depth of one-sixteenth of an inch.

Iochroma

A small genus containing about fifteen species of tall shrubs with slender stems, having opposite entire leaves and long tubular-shaped flowers growing in pendulous bunches of ten or a dozen. Flowering late in the Fall, they make a welcome addition to our collection of flowering shrubs. The best proven species are Iochroma grandiflora from Peru, Iochroma lanceolata a native of Chili and Iochroma tubulosa from Central America. They should be grown in a sheltered situation and given plenty of manure and water.

Iochroma tubulosa.

Propagate by cuttings in early Fall; shade from direct sun.

Itea

Itea virginica is the only species of this genus widely grown in California. There are at least four other species which would make worthy additions to any shrubbery. As most of them flower late in the Summer, a season of the year when few shrubs are in bloom, they should be seen in our gardens more commonly than they are.

The Iteas thrive best in a moist sheltered situation in light sandy loam.

Propagate by seeds sown one-eighth of an inch deep in Spring, or by suckers taken, in Winter, from the base of old established plants or by layers in July.

Jacaranda

This beautiful tree, which gives such splendid effects in the warmer portions of this State, is a native of Brazil and should, to do well, be given generous treatment and a warm situation away from strong winds. It grows well in any garden soil which is not too stiff and heavy.

The Jacaranda is propagated by means of cuttings placed in a cold frame, during August, in soil composed of one-half sand and one-half leaf-mold. The cuttings should be shaded during strong sunshine until they form roots, and, when rooted, they should be planted in small pots and afterwards given larger pots as required.

Juglans

The Walnut and Butternut belong to this genus, both being noble park trees forming massive straight trunks and wide-spreading branches, while their handsome, pinnate, glossy leaves add much to their attractive appearance. There are several species including Juglans regia (the English Walnut), Juglans cinerea (Butter Nut), Juglans nigra (the Eastern Black Walnut), Juglans californica and the Japanese species, Juglans sieboldiana. All form grand park trees requiring considerable space for their proper growth and development as well as deep well-drained soil and sheltered situations.

Propagate by seeds planted, in Winter or early Spring, one inch deep in nursery rows. Transplant the seedlings to their permanent quarters when they are not more than two years old.

JUNIPERUS (*Juniper*)

Ornamental evergreen trees or shrubs with needle or scale-like leaves set thickly on the stems or branches, the flowers being inconspicuous and the fruit a small cone-like berry. All are perfectly hardy in California, being mostly natives of temperate climates. The genus contains species with low-spreading habit of growth, well adapted for covering rocky ledges or forming ground work for hiding bare ground under large trees; some having a stiff pyramidal habit are much used in formal gardening, while others make fine single specimens on the lawn or planted in groups about large pleasure grounds.

Juniperus chinensis.

The best of the species with bushy habit are Juniperus chinensis, Juniperus communis, Juniperus californica, Juniperus suecica, Juniperus virginiana, Juniperus bermudiana, and Juniperus Fortunei. There are also many varieties of each of the species, a number of which are very attractive. The best of the creeping species are Juniperus Sabina, Juniperus procumbens and their varieties, many of which have variegated leaves.

Propagate, in October, by cuttings in sandy soil in a cold frame; when they are rooted in Spring transplant them about two inches apart into boxes and give them the room their growth requires. They may also be propagated by seeds sown one-sixteenth of an inch deep in the open ground in Spring, the seeds preferring a shady situation.

Kerria

Slender-branched deciduous twiggy shrubs with bright light-green leaves and bright-yellow flowers. Being among our earliest Spring-flowering shrubs they are much in demand and should be seen in every garden however small. The double-flowering variety has the prettier flowers, but the single-flowered is the more elegant in habit and keeps in flower for a much longer period than the double-flowering variety.

Propagate by cuttings in the Fall or by division of the roots in early Spring.

Kœlreuteria paniculata

A small handsome deciduous tree from north China, with a spreading, irregular habit of growth. It thrives best in good soil and a sheltered situation where its long panicles of yellow blossoms are very attractive.

Propagate by cuttings placed in a cold frame in early Fall.

Laburnum (*Golden Chain*)

Ornamental shrubs or small trees with trifoliate leaves and pendulous racemes of pea-shaped flowers. They are all highly ornamental and free-flowering and grow in any garden soil, but in sunny California seem to desire a shady situation. Like many deciduous trees they are liable to be attacked by the grey fungus which has a tendency to harden and tighten the bark; when this is the case, spray them in Winter with lye mixture.

The following are the best varieties of this very beautiful Spring-flowering tree:—Laburnum vulgare, Laburnum vulgare aureum (golden-yellow leaves), Laburnum vulgare involutum, Laburnum vulgare quercifolium and Laburnum vulgare Watereri. A species with purple flowers named

Laburnum Adami, is also well worthy of a place in any collection.

Propagate by seeds sown one-quarter of an inch deep in the open ground in early Spring; leave them in the seed-bed one year and then transplant them to nursery rows where they should remain until large enough to be planted out.

Lagerstrœmia (*Crape Myrtle*)

A strong-growing free-flowering deciduous shrub producing an abundance of soft-fringed flowers during the Summer months. The Crape Myrtle delights in a light rich soil and a warm sunny situation, the climate of San Francisco being too cold for this most beautiful shrub, so it is not advisable to plant it in that neighborhood, but in the interior of the State and in southern counties it should be in every yard.

Propagate by cuttings in the early Fall; grow them in pots until they are ready to be planted out.

Lantana

A large genus of evergreen and deciduous shrubs belonging to the Verbena family. Growing freely in any garden soil and of a rambling habit of growth, it is well adapted for forming undergrowth for filling in open spaces between upright growing shrubs or for forming thickets under deciduous trees.

Lantana.

It also is very useful as a covering for steep banks where few plants of a shrubby character are successful. It requires very little artificial watering.

Propagate by cuttings in October.

LASIANDRA (*Pleroma*)

The Lasiandra is another of the Brazilian introductions which has surprised many cultivators by doing so well out of doors in our State. In Europe and in the Eastern states, it is treated as a hothouse plant and given temperature strictly tropical, but here in California it grows well and flowers splendidly, blooming in the open air even in San Francisco from December until June. It requires a sheltered situation and a light sandy soil.

Lasiandra macrantha.

There are many varieties of this beautiful shrub but Lasiandra macrantha will be found the best adapted for growing in this State.

Propagate by cuttings placed, in July or August, in a cold frame in soil composed of sand and leaf-mold in equal proproportions.

LAURUS CAMPHORA (*Camphor-tree*)

This handsome evergreen is a native of Japan and produces the camphor of commerce. It has a close pyramidal or oval-shaped head with laurel-like leaves, the young leaves having a pink tint which gives it a striking appearance. in the landscape. In the Southern and warmer portions of the State it makes a very good sidewalk tree.

Propagate, in March, by seeds sown one-eighth of an inch deep, or by cuttings, also in March, put into cutting-mixture, composed of half sand and half leaf-mold; place in a

An Arbor of Leptospermum laevigatum.

cold frame until the cuttings are calloused and give gentle bottom heat until rooted.

Laurus nobilis

The Laurus nobilis is a handsome evergreen hardy tree, a native of Southern Europe. It has dark-green, oblong, pointed leaves, is of an upright habit and grows to the height of about forty feet.

Propagate by cuttings inserted in sand in a cold frame, in October.

Leptospermum

This handsome member of the Myrtle family is one of our most popular shrubs, growing vigorously in the poorest sand and in the most exposed situation. It also is one of the best shrubs for seaside planting. It is of a semi-pendulous graceful habit, and, when covered with its long sprays of marble-white flowers, makes a grand effect in the landscape. Leptospermum lævigatum is the best of the species.

Leptospermum.

Propagate by seeds sown one-eighth of an inch deep in Spring; prick them off about three inches apart in boxes, and plant them out in their permanent quarters when they are a foot high.

LEUCADENDRON (*Silver-tree*)

This is the celebrated Silver-tree of South Africa. In the Cape of Good Hope it grows to a height of about thirty feet. It gets its name from its leaves which are of a soft silvery-white color and densely covered with white silky hairs. It does well in light loam and must have a warm sheltered situation where it becomes, when in health, a very striking object. Leucadendron argenteum, the best of the species, should be more commonly seen as it forms a handsome tree.

Propagate by seeds secured from South Africa; plant them one quarter of an inch deep as soon as received from their native locality; start them in a warm greenhouse and be very careful not to overwater them.

LIBOCEDRUS (*Incense Cedar*)

A genus comprising eight species; two are natives of New Zealand, one of California, two of Chile, one of Japan, one of China, and one of New Caledonia. Our native species, Libocedrus decurrens, is of a densely-branched habit of growth and rather formal in outline. Libocedrus chilensis is of the same habit but has leaves of a light glaucous green. Libocedrus doniana, the New Zealand species, is also rather stiff and formal in habit but differs from the Chilean species in having bright-green leaves. All are of easy growth and thrive in our climate if given shelter and well-drained soil.

Libocedrus decurrens.

Propagate by seeds sown in Spring, one-quarter of an inch deep in light sandy soil; protect them from hot sun until they are one inch high when they may be planted in nursery beds out of doors.

LIGUSTRUM (*Privet*)

This genus contains about twenty-five species of ornamental, hardy, deciduous or evergreen shrubs or small trees indigenous to Europe, temperate Asia and Australia. They are easily cultivated, will grow in any good garden soil and make excellent subjects for grouping in the pleasure-garden. They flower freely and remain in bloom for several months. The Japanese species Ligustrum Ibota, Ligustrum japonicum, Ligustrum lucidum and Ligustrum ovalifolium, are among the best and should be used freely in planting large grounds. Ligustrum ovaliforlium and Ligustrum japonicum make good hedge plants.

Ligustrum japonicum.

Propagate by cuttings in the Fall, or by seeds sown in open ground in Spring. Cover the seeds to the depth of one-eighth of an inch.

LIQUIDAMBAR (*Sweet Gum*)

A small genus of about four species of which the North American species Liquidambar styraciflua is the best. It has a maple-like leaf, grows to the height of about sixty feet, and, when late in the Fall it has taken on its Autumn tints, it has a

very striking appearance. Its cork-like barked branches give it a picturesque and interesting character, suitable for informal planting. Plant in low sheltered situations in soft moist soil and give plenty of water during the growing season.

Propagate by seeds sown in Spring in open ground, covered to the depth of one-quarter of an inch.

Liriodendron (*Tulip-tree*)

The Tulip-tree, one of the most desirable of deciduous trees, is of pyramidal habit with fiddle-shaped leaves and tulip-shaped flowers. It makes a handsome avenue tree, being clean of stem and of smooth foliage, turning bright-yellow in the Fall. It must have rich bottom land and a sheltered situation to do well.

Propagate by seeds sown, in the Fall or as soon as ripe, in the open ground. Cover the seeds to the depth of one-quarter of an inch.

Lyonothamnus

A handsome evergreen tree found only in the islands of Santa Barbara channel. In Santa Cruz Island it grows to the height of sixty feet. This tree should make an excellent addition to our coast collection, and, as it is a rapid grower of good habit and has a bright grass-green leaf, should be planted extensively.

Propagate by cuttings placed in sand in cool frame in October.

Magnolia

A highly ornamental genus of about twenty species of evergreen or deciduous trees and shrubs. The evergreen Magnolia grandiflora with its massive leaves and large white fragrant flowers is well adapted for planting either as single specimens on the lawn or in large or small groups. The deciduous species, Magnolia acuminata, is a vigorous-growing lofty tree with spreading branches.

Magnolia stellata.

Magnolia tripetala is another strong vigorous grower which should be seen more often. Besides those of tree form, many species are low-growing, shrubby and very floriferous, some of them blooming in early Spring before they unfold their leaves. These include Magnolia conspicua and its varieties Magnolia soulangeana, Magnolia obovata, Magnolia parviflora and Magnolia stellata. The banana odor of the flower of Magnolia moschata is so powerful that one or two flowers will perfume a whole house. Magnolias delight in a warm, sheltered situation, a rich sedimentary loam soil and plenty of water during the growing season. If given these conditions they will well repay any care bestowed on them.

Propagate, about September, by layers or by sowing the seeds, as soon as ripe, one-quarter of an inch deep in pots of sandy leaf-mold under glass. When the young seedlings are three inches high, pot them singly in three-inch pots and shade them for a few days after which they may be given air and full light.

Maytenus

A genus of evergreen trees or shrubs mostly natives of Chile, of an upright habit of growth, with myrtle-like leaves, forming very elegant and graceful shrubs with small white, yellow or red flowers. Maytenus Boaria (with white flowers) and Maytenus chilensis (bearing greenish-yellow flowers) are the most desirable species.

They thrive in any garden soil and in any situation, being particularly adpated for growing in the Southern part of California, while they also do well in San Francisco and neighborhood.

Propagate by cuttings in early Fall.

Melaleuca

A genus comprising about one hundred species of mostly evergreen shrubs or trees, natives of Australia. All have black stems and white-barked branches. They are all highly ornamental and graceful in habit, thrive in poor soil and require only a moderate supply of water,—indeed, if well-cultivated, requiring no artificial irrigation whatever.

Melaleuca Leucadendron.

Melaleuca decussata, Melaleuca fulgens and Melaleuca Leucadendron will be found among the best species for general cultivation.

Propagate by cuttings of half-ripe wood in Summer or by seeds sown in March or April. Cover the seeds lightly.

Melaleuca Leucadendron.

Melia Azedarach (*Umbrella-tree*)

The Umbrella-tree is one of the most popular shade trees in California, being a rapid grower and of easy propagation, growing freely from seed. Its bright-green foliage, which it carries until late in the season, together with its long sprays of fragrant lilac-colored blossoms make it a general favorite

Mespilus japonica.

through the warmer districts of the State, where it does exceedingly well excepting very close to the coast. There the fresh sea-wind whips the long pinnate leaves from the exposed side, destroying its symmetry and formal habit.

Propagate by seeds sown, one-quarter of an inch deep, in the Fall; leave them one year in seed-bed and then transplant them into nursery rows where they should be allowed to remain until they are large enough to be planted in permanent quarters.

Melianthus major

The Melianthus is a shrub especially effective in large grounds where fine subtropical effects are desired, as its graceful habit and large glaucous leaves make it very desirable for this purpose.

This shrub is propagated by cuttings which should be placed in a cold frame, during September or October, in soil composed of sand and leaf-mold in equal proportions.

Mespilus (*Medlar*)

The Medlar, although considered more a fruit than an ornamental tree, is nevertheless frequently grown as the latter. This is especially so in the case of the Japanese species which has large handsome leaves and forms a very fine shade tree. Any good garden soil is suitable for growing the Medlar.

Propagation of this tree is by means of seeds which should be sown during Spring in a cold frame. The seeds should be covered to the depth of a quarter of an inch.

Metrosideros

A genus of about eighteen species natives of the Pacific Islands, New Zealand and New South Wales, mostly shrubby in habit, having narrow pointed leaves and showy flowers, growing well in any garden soil and requiring no artificial watering where the ground is well cultivated and kept clear of weeds.

Metrosideros robusta.

Propagate by cuttings in early Fall or by seeds sown, in Spring, one-quarter of an inch deep in a cold-frame. When the seedlings are one inch high, transplant them two inches apart in boxes.

Morus nigra (*Mulberry*)

The Mulberry is cultivated chiefly for feeding the silkworm. It grows to the height of from twenty to sixty feet, having large heart-shaped leaves and spreading habit; it should be given fairly good soil and a sheltered situation.

Propagate by cuttings placed in open ground late in the Fall after the leaves have dropped, or by seeds sown in Spring. Cover the seeds to the depth of one-quarter of an inch. The following Spring transplant them one foot from each other into nursery rows two feet apart.

Myrica

This genus contains only a few species, one indigenous to California, one to Europe, two to Japan and one to Canada. It grows to a height of sometimes forty feet, is bush-like in habit, has a willow-like bright-green leaf and bears a purple or red fruit. It delights in a light sandy soil in a sheltered situation with plenty of moisture, preferably the margin of a lake or swamp.

Propagate by seeds sown one-eighth of an inch deep in Spring, or by cuttings placed in the open ground in October.

Myrtus (*Myrtle*)

The Myrtle is an extensive genus comprising over one hundred species, mostly natives of Australia, South America and Southern Europe. The common species (Myrtus communis) is one of our most popular and best known shrubs, its fragrant leaves and pretty white flowers making it a general favorite.

There are many handsome species, including Myrtus bullata (which grows from ten to twenty feet high) and Myrtus apiculata.

It is of easy culture and grows well in any soil not too heavy, being readily propagated by cuttings placed in sandy leaf-mold in a cold frame in early Fall, or by seeds sown, in Spring, one-eighth of an inch deep in a cold frame.

Nandina

Nandina domestica.

This genus contains but a single species, the elegant Nandina domestica. It is of upright habit with compound leaves which in the young state are beautifully tinted with pink; the fruit is oval in shape and about the size of a large pea. It is good for small grouping.

Propagate by division of the roots in early Spring and by seeds sown in Spring one-quarter of an inch deep in a cold frame.

Nerium (*Oleander*)

A small genus of very ornamental evergreen flowering shrubs of erect habit, natives of the Mediterranean regions. In the warmer districts of the State the Oleander is a general favorite on account of its easy culture and its generous long-continued supply of gaily-colored flowers. Close to the coast, although the Oleander grows to wood well enough, it does not flower freely, therefore it is not recommended as a coast shrub or for planting in San Francisco except against a wall facing the South.

Propagate by cuttings of ripe wood placed, about April, in sandy leaf-mold, in a warm propagating house; as soon as they are rooted, pot them singly in three-inch pots and give them room as required.

Olearia

A large genus mostly Australian. Some of them make beautiful bushes and should be more often seen. They suc-

ceed in any good soil and require little water if given thorough cultivation. The best flowering kinds are Olearia Forsteri, Olearia gunniana and Olearia Haastii.

Propagate by cuttings of half-ripe wood inserted, in October, in sandy leaf-mold, placed in a cold frame, and kept close and shaded from hot sunshine for two weeks.

Olea europæa (*Olive*)

What the Elm or the Oak is to Northern Europe, what the Conifers are to the Mountains of California, the Olive is to Italy, where it is grown both for its oil and as an ornamental tree. As a feature of the landscape it is very effective, its grey-green foliage and its soft willow-like habit fitting it well for grouping if allowed to grow naturally and not subjected to the pruning-knife.

It grows in any soil, even on a rocky hillside where it produces fine effects without irrigation.

Propagate, in Spring, by cuttings of either young or old wood, or by seeds sown one-half inch deep in the open ground; keep them in the nursery until well established.

Osmanthus

So named on account of the fragrance of its flowers. There are several species (one American), the Japanese being the most desirable.

Osmanthus Aquifolium has handsome holly-like leaves, is evergreen and of good habit, bearing white flowers. Osmanthus fragrans has entire, elliptic-shaped leaves and bears yellow flowers.

Propagate by cuttings set in a cold frame in the early Fall. The Osmanthus is not particular as to soil, but prefers a warm situation and partial shade from noonday sun.

Parkinsonia

This beautiful Mexican shrub, with its feathery drooping branches and yellow flowers, is becoming a general favorite in all of our gardens where a collection of fine shrubs is aimed at.

Propagate by seeds sown as soon as ripe, in a warm greenhouse or frame; cover the seeds with a quarter of an inch of soil. The seedlings should be transplanted to the open ground when they are six inches in height.

Paulownia

Ornamental deciduous trees with catalpa-like leaves and fox-glove-like flowers, well adapted, when young, to give semi-tropical broad-leaved effects, and, in well-sheltered situations and good soil, making a good street tree.

Propagate by seeds sown, in Spring, one-quarter of an inch deep in the open ground in light rich soil.

Philadelphus (*Mock Orange*)

Ornamental deciduous shrubs, with opposite leaves and white flowers in terminal racemes on short branches appearing in May and on until July. They are well adapted for shrubbery undergrowth, liking partial shade. When exposed to the full sun, the flowers are smaller and lack the delicate tinting of those grown in half shade. Any fair garden soil will suit them as they are of easy culture. Prune the bushes as soon as the flowers fade, to encourage the making of strong young shoots to take the place of those cut, as it is on the previous year's wood that they flower.

Philadelphus.

There are several species worthy of a place, including Philadelphus coronarius, Philadelphus

gordonianus, Philadelphus grandiflorus and others of which some varieties have double flowers and some variegated foliage.

Propagate by cuttings of ripe wood placed in sandy soil in the open ground in November or as soon as the leaves fall.

Phillyrea

A genus comprising only four species, all evergreen and ornamental, natives of the Mediterranean regions. They have a rather upright habit, and small, myrtle-like, glossy, dark-green leaves. The flowers are small and not showy. They grow freely in any good garden soil to a height of ten feet and form a dense bush.

Propagate by cuttings, in the Fall, placed in sandy soil in a cold frame.

Photinia (*California Redberry or Holly*) (*Heteromeles arbutifolia*) (*Toyon*)

A genus of highly ornamental trees or shrubs mostly natives of India, China and Japan, one being indigenous to California. All are handsomely leaved. Our native species is the glory of our hillsides in Fall and Winter, and indispensable for decorating our rooms and banquet halls at Christmastide, its great bunches of crimson-red berries contrasting well with its glossy green foliage. The Redberry delights in a sunny situation and a loose rocky soil.

Propagate by seeds sown one-eighth of an inch deep in open ground in the Fall; transplant them when they are three inches high and replant them each year until they are large enough to be planted where required, as it is rather difficult to move them safely when they are left too long in one place.

Picea

The Pitch Firs are classed among the most ornamental of the Conifer family, all of the species being highly prized for their beautiful form and tall pyramidal stately outline, making, when in health, splendid specimens for decorating the lawn either singly or in group form.

In addition to our native species, the Eastern and Japanese species and even the Himalayan and Norwegian thrive in California, growing well in any garden soil which is properly drained.

Propagate by seeds sown in Spring, one-quarter of an inch deep, in a shady spot; transplant the following year.

Pimelia

The Pimelias are among our most showy late-Winter and early-Spring flowering shrubs, mostly natives of Australia and New Zealand. They have a neat compact habit of growth, being easily grown and easily propagated, while any fairly good soil will suit them. They make excellent plants for the margins of groups of taller-growing shrubs, or in small groups by themselves or singly in borders. There are about seventy species, only a few of which have been introduced into California.

Pimelia rosea.

Propagate by cuttings placed in sandy leaf-mold, in a cold frame in September or October; shade during hot sunshine; pot them singly in small pots when they are rooted.

Pinus (*The Pine*)

This highly ornamental as well as most useful genus comprises about seventy species indigenous to most of the North Temperate Zone and contains many exceedingly ornamental and picturesque trees for landscape improvement. Pinus insignis (the Monterey Pine) by many authorities is considered to be the most ornamental of all the species either native or foreign. Another native, Pinus lambertiana (Sugar Pine) is without doubt the most gigantic of all. The Pine is not particular as to soil provided it is well drained, although there are some, such as Pinus murrayana and Pinus rigida, which prefer a wet or swampy situation.

California is very rich in varieties of this genus, no less than sixteen species being indigenous to this coast.

A Group of Pines.

Among the most desirable foreign species may be included Pinus Cembra, Pinus halepensis and Pinus Pinea (the Italian Stone Pine) perhaps the most picturesque species of the genus. This Pine prefers a sandy soil and a seaside sheltered situation.

Propagate by seeds sown, in March or April, from one-quarter to one-half an inch deep (according to the size of the seeds) in a cold frame. When the young seedlings are two or three inches high, they should be placed in nursery rows in the open ground, and, when from twelve to eighteen inches high, should be planted out in their permanent quarters in Winter.

Pittosporum

The Pittosporums form a large genus of over one hundred species, all evergreen and mostly natives of the Australian group. All the introduced species are of the easiest culture and not particular as to soil. They make grand single specimens on the lawn, besides being very effective in grouping, and also make excellent ornamental hedge plants.

Pittosporum undulatum.

The species best adapted to California are Pittosporum crassifolium, Pittosporum eugenioides, Pittosporum nigricans, Pittosporum Tobira and Pittosporum undulatum.

Propagate by seeds sown in March one-quarter of an inch deep, in a cold frame, or by cuttings placed in sandy leaf-mold in a cold frame in September.

Platanus (*Plane-tree; Sycamore*)

This genus contains only three species, all being magnificent trees for parks and large grounds. To grow well, they should have a deep, soft, moist soil and a well-sheltered site, preferably a river bottom where their roots may easily reach perennial waters.

Propagate by seeds; the seeds are contained in round balls which must be broken to free the seeds. Sow in February, one-eighth of an inch deep in a shady place, and keep them well watered until they germinate; transplant them to nursery rows when they are one year old.

Plumbago

A genus comprising about ten species of hardy shrubs or annual herbs, natives of the Cape of Good Hope, the East Indies and Southern Europe.

Plumbago capensis (the pale-blue variety) is the most popular of the species, being admirably adapted for training on trellises or pillars as is also Plumbago zeylanica (the white-flowering variety). The latter does well as a garden shrub. Whether grown as a shrub or for the purpose of covering walls or trellises, it should be cut back hard after the flowering season is over in the late Fall.

Propagate by suckers, which should be taken off in the early Spring and placed in nursery rows, or by cuttings placed in a cold frame in light sandy leaf-mold in September.

Poinciana (*Peacock-flower*)

A genus of very pretty flowering trees or shrubs, natives of the West Indies and Eastern North Africa. They must have a warm sunny situation where they form grand effects in Summer and Autumn.

Poinciana pulcherrima (the East Indian species) grows to the height of about twelve feet and bears great masses of orange-yellow flowers.

Poinciana regia (from Madagascar) is the largest of the genus, reaching, under favorable conditions, the height of from thirty to forty feet and having a trunk three feet in diameter. With its beautiful bipinnate leaves two feet in length it is very effective in the garden or grounds, especially when it is covered with its gorgeous masses of bright scarlet and yellow flowers.

Propagate by cuttings in the Fall (protect them with glass frame during the first Winter), or by seeds sown, in early Spring, in a cold frame; cover the seeds to the depth of one-quarter of an inch.

Polygala

The Polygala is an extensive genus comprising over two hundred species, only a few of which are worthy of cultivation, Polygala dalmaisiana (the common species) being the best of the genus.

Polygala dalmaisiana.

It loves a cool climate near the coast away from frost, although it will stand a few degrees without injury. The Polygala, like the European Whin, seems to flower every month in the year and has a neat dwarf bushy habit.

Propagate by cuttings placed in a cold frame in sand and leaf-mold, in October; when rooted, pot them off singly in thumb-pots, shading the newly potted plants until they get over the change.

POPULUS (*Poplar*)

A well known genus of deciduous trees natives of Europe, Asia and America. The genus contains about eighteen species, many of which, when given congenial soil, are among the most rapid growers of the forest. They thrive best in a deep damp soil, where the underground water is near the surface, or along the banks of creeks or watercourses.

The favorite species are the Carolina, the Lombardy (pyramidalis), the Aspen and the silver-leaved.

Propagate by cuttings placed in the open ground in November.

PRUNUS (*Plum*)

The Plum is one of our earliest flowering trees, often opening its showers of pink and white blossoms early in January. It forms a most handsome tree and should be seen in the landscape much more commonly than it is, growing freely in any fairly good soil and requiring no irrigation if the soil is kept loose and free from weeds.

Prunus sinensis.

The first to bloom is the Prunus Pissardi (a native of Persia) having white flowers tinted with pink, while, a little later, its reddish-purple leaves and, in the Fall, its handsome light-red fruit make it a very desirable small tree. It grows to the height of about thirty feet.

Prunus Mume, the famous flowering Plum of Japan, with its showers of bright pink blossoms, makes a handsome feature in the landscape. Groups of this beautiful, hardy, free-

flowering tree are most effective when grown with a background of dark-foliaged fir, spruce, or yew, or flanked with a belt of Japanese Retinospora obtusa.

Prunus pendula, the Weeping Japanese Cherry is a small tree growing to the height of twenty feet having drooping branches forming a pyramid. When in bloom it is very beautiful, being graceful in habit and covered with myriads of cherry pink blossoms.

There are many other species which are very desirable for decorating the shrubbery, such as the double-flowering Prunus sinensis flore pleno, with pink or white flowers, and Prunus triloba, also a double-flowering species of shrubby habit.

Propagate by cuttings inserted in the open ground in November, or by seeds planted about one inch deep and three inches apart, in Spring.

Punica Granatum(*Pomegranate*)

The Pomegranate is a small deciduous tree, native of Persia, with bright scarlet and orange-colored flowers and ornanamental subacid-flavored fruit. It forms a very pretty low tree or shrub when in flower in early Summer and again when in fruit in the Fall. The double-flowered variety makes an excellent bush or hedge.

Punica Granatum.

Any good garden soil suits it as it is easily grown if given good cultivation.

Propagate by cuttings, layers or suckers in Autumn after the leaves fall.

Pyrus (*Apple*)

The color effects produced by masses of apple-blossoms are among the finest of any flowering tree especially in the case of the double and semi-double-flowering varieties. Fruit trees which have beautiful flowers should be planted in group form for their landscape effects much more commonly than they are. The Belle-fleur Apple, planted say six in a group, with a background of dark foliage, gives, when in flower, one of the most pleasing effects possible, and besides, if given good cultivation, furnishes just as fine fruit as if planted in orchard form.

Pyrus floribunda.

Pyrus floribunda, Pyrus japonica, Pyrus Malus, and its varieties, Pyrus americana, and Pyrus Aucuparia (the Mountain Ash) are all valuable in landscape work.

Propagate by seeds sown one-quarter of an inch deep in Spring; transplant, the following Spring, into nursery rows one foot apart in the row, the rows being two feet apart from each other.

Quercus (*Oak*)

The Oaks belong to all countries which enjoy a temperate climate, and every country owning them is proud of its Oaks with their immense trunks, their picturesque character and great spread of limbs. For landscape effects on a large scale the Oak tree is indispensable, its rugged stem and twisted branches furnishing an element of character not to be found in any other genus.

All of the family are worthy of a place in any collection, but our natives should be preferred, as they give the same

general effects as the Eastern and the European species; besides we know that our native species are sure to be long-lived, as they are comparatively free from disease and immune from the attacks of injurious insects. Many Oak trees which are long-lived in their native countries have proved to be short-lived when transplanted to a foreign country. The English Oak, for instance, which in Europe lives, under favorable conditions, to the great age of from fifteen hundred to eighteen hundred years, is said to show signs of decay when it reaches the age of from fifty to seventy years in the Eastern States. Native trees, therefore, should at all times be given the preference when the indigenous species give the effects desired.

The White Oak delights in a deep rich heavy loam resting on a clay subsoil, the Live Oak in a rich loam on a gravel sub-

Quercus Suber.

soil. Stagnant water about the roots of a Live Oak will cause the tree to become sickly and to fail to grow satisfactorily. Our native Black Oak, one of our most desirable species, loves a rich pocket of soil on a sheltered hillside. In such a situation it is one of the most attractive and noble of all the Oak family.

California is justly proud of its Oaks, and it is hoped that owners of fine specimens, of whatever kind or species, will spare them as long as possible, remembering that it takes at least a hundred years to grow them and that many of our grand specimen Oaks were large trees when Drake and Balboa first visited the Coast.

Among the most desirable non-indigenous species are the English Oak (Quercus Robur), the Turkey Oak (Quercus Cerris), the Cork Oak (Quercus Suber), the Pin Oak (Quercus palustris), the Willow Oak (Quercus Phellos) and the Southern Evergreen Oak (Quercus virginiana) while all the others are well worthy of prominent places in large pleasure-grounds, public or private.

Propagate by seeds planted one inch deep as soon as ripe; transplant them when one year old, into nursery rows, and again transplant them at least every two years until they are large enough to be planted in their permanent quarters.

Retinospora

A genus of conifers closely allied to the Cypress and Thuya families and mostly native of Japan.

They are all worthy of a place in a garden of choice plants, some being pyramidal in form while others are round-headed and bush-like.

The golden Retinospora with yellowish foliage and the silver variegated are effective.

Propagate by cuttings placed in sand in a cold frame in October or November.

Rhamnus (*Buckthorn—Wild Coffee*)

This handsome evergreen or deciduous shrub is one of those most suitable for being planted in the portion of the grounds farthest distant from the water hydrant as it requires little attention after the first year. It grows in any soil, forms a dense mass of foliage, and, for planting as a shelter belt or screen, is equaled by few shrubs.

For general planting purposes, Rhamnus californicus, our native wild coffee, will be found one of the most satisfactory.

Propagate by seeds planted either in the open border or wherever the shrub is desired, covering the seeds to the depth of half an inch.

Rhododendron

The Rhododendron is justly classed among the noblest of shrubs, its laurel-like foliage, its massive habit and gorgeous trusses of flowers making it, when well grown, one of our favorite evergreens.

The Rhododendron prefers a shady situation and a moist atmosphere; it also likes a light sandy soil and plenty of water at the roots but abhors lime and alkali either in the soil or in the water.

Rhododendron catawbiense and its varieties seem to do better than any other species in California, although some of the Himalayan species, where well protected, make good growth and flower freely, in some instances making three feet growth in a single season.

Rhododendron californicum becomes a splendid specimen and should be seen more often. Rhododendron ponticum and its varieties are doing excellently where the conditions are favorable, as are also the many hybrids now being introduced.

The Rhododendron must be kept away from cold draughty

situations and must have shade in the Summer season with plenty of water at the roots—but no stagnant water.

Propagate by seeds sown in Spring. As the seeds are very minute they should be sown in pots or pans which should first be thoroughly well drained and filled with sandy peat; press the soil firm and smooth; soak thoroughly with water and, after sowing, press in the seeds and cover them lightly with silver - sand; place the pans in gentle heat and shade until the young seedlings appear, when they should be given more air and light; when they are large enough to be handled, prick them off into pots and replace them in the same temperature until they take fresh root when they should be placed in a cold frame and given room as required.

Rhododendron.

Propagation may also be effected by planting cuttings of the young wood, in August or September, in soil composed of half silver-sand and half leaf-mold, in a shaded cold frame or under a tree sheltered from cold winds.

Robinia (*Locust*)

The Locust is one of the most desirable of the deciduous trees. It has handsome pinnate leaves and bears its flowers in long racemes of white, rose or purple blossoms. Any good garden soil is suitable for its growth.

Propagate by seeds sown in the open ground during early Spring; cover the seeds one-half inch deep. In the following Spring the seedlings should be transplanted into nursery rows.

Romneya Coulteri (*Matilija Poppy*)

The Romneya is beyond doubt the finest of all wild flowers, none of the newly introduced varieties of the Poppy family being equal to this wonderful native flowering shrub. Every garden, unless extremely small should have its plant of Matilija Poppy.

Romneya Coulteri.

The Romneya Coulteri thrives in any soil (provided it is well drained) and requires no artificial irrigation, but it must have a sheltered, sunny exposure in order to perfect its large and beautiful Peony-like white flowers.

This Poppy is propagated by seeds sown in a warm frame during early Spring, sandy leaf-mold being used and the seeds being covered to the depth of a quarter of an inch. It may also be propagated at the same season by division of the roots.

Salix (*Willow*)

This genus contains over one hundred and fifty species, indigenous from the farthest North of the Alaskan timber-line to Mexico and from Norway to the Levant. The Willow loves a sheltered valley and a moist soil by the side of a stream where its bunches of rootlets may be seen floating on the water.

Salix alba (the White Willow) and its variety vitellina (the Golden Willow) and Salix babylonica (the Babylonian Weeping Willow) are among the best for ornamental planting.

Propagate, in November, December or January, by

placing a cutting, of any size or length, one-third of its length in any soil; give it plenty of water.

Sambucus (*Elder*)

A genus of low trees or shrubs comprising about twelve species, all hardy, which will grow in any soil or situation, even the most exposed.

Our native species, Sambucus glauca, grows to the height of about twenty feet and is common throughout the State. It is not recommended as an ornamental tree or shrub for large planting in ornamental grounds but rather as a shelter shrub in exposed situations and in poor soil. Sambucus racemosa is very similar in habit to Sambucus glauca, only the berries, instead of being black, are bright scarlet and are much more effective in the landscape on that account.

Sambucus aurea, a golden-leaved variety, is a fine ornamental plant, and, when planted in masses in the shrubbery, is very effective.

Propagate by cuttings placed in the open ground late in October.

Schinus Molle (*Pepper-Tree*)

The Pepper-tree is a universal favorite and is worthy of a place in every garden, its graceful semipendulous habit of growth with its pleasing rounded outline and the olive-green color of its compound leaves contrasting well with most of the other trees and shrubs.

Schinus Molle, a native of Peru, is much the most handsome species of the genus and is the only species recommended for general planting. The Pepper grows well in any ordinary garden soil with very little cultivation and is highly recommended for planting in the vicinity of chicken yards and outhouses.

Propagate by seeds sown, one-eighth of an inch deep, in a cold frame in early Spring; pot off the seedlings singly in three-inch pots when they are three inches high, and give them room as required.

SEQUOIA (*Redwood*)

The giant Redwood of California has a world-wide reputation and is one of the wonders of the State, being without doubt the largest of the great family of Conifers. As a landscape tree it is possibly a little formal in habit, but, when a stately conical massive group of formally shaped trees is required, no tree is more effective, young specimens, from fifty to one hundred years of age and of the same number or more feet in height, forming magnificent groups in any landscape.

Sequoia gigantea.

The Sequoia gigantea loves the mountains and is found growing only in sheltered valleys over four thousand feet above the sea level, in deep soil within close proximity to the snow-line and also where perennial water is percolating within a few feet of the surface of the soil.

Sequoia sempervirens, on the contrary, prefers a low altitude near the coast but otherwise requires the same conditions of deep soil, reasonable shelter and water close to the surface. Although seldom found growing more than thirty miles away from the coast, it is rarely found nearer the coast than from three to four miles, the harsh winds blowing in from the ocean seeming to blast off the leaves and stunt the growth of any which sprout within close range of the ocean, unless they are given shelter.

Propagate, in Spring, by seeds sown one-quarter of an inch deep in boxes placed in a cold frame; prick off the seedlings as soon as they are large enough to be handled and plant them

in nursery rows in the open ground until they are from twelve to eighteen inches high when they should be planted in their permanent situations.

Sollya heterophylla (*Australian blue-bell*)

The Sollya is a very pretty semi-twiner with blue bell shaped flowers, and is valuable for finishing small groups, covering a steep slope, rockeries, etc.

Propagate by cuttings placed in sand in a cold frame in October or by seeds sown under glass in early Spring.

Sophora

A genus of hardy deciduous or evergreen trees or shrubs mostly natives of China, India and Japan, one being a native of New Mexico, and another indigenous to Chile. They thrive well in any good, well-drained loamy soil, not too stiff.

Sophora japonica, the Japanese Pagoda-tree, is the most handsome of the genus, having a graceful form and pleasing outline.

Propagate by seeds sown one-quarter of an inch deep in the open ground in Spring. The weeping and variegated forms are increased by grafting, in Winter, on the common stock at the height of stem desired.

Plant in a rather low, well-sheltered situation and give plenty of water at the roots during the growing season.

Sorbus Aucuparia (*Mountain Ash*)

A genus of ornamental deciduous trees or shrubs, all hardy in California, the genus comprising about thirty species. All have handsome foliage and many have showy bunches of red berries which remain long on the bushes, often until late in the Winter.

One species (Sorbus sambucifolia) is a native of California but is only found wild in the Sierras at an elevation of from five thousand to eight thousand feet.

There are several other species, including the Service-tree (Sorbus domestica) and the Eastern (Sorbus americana) all worthy of cultivation.

Propagate by seeds sown, in early Spring, one-eighth of an inch deep in the open ground.

Spartium junceum (*Spanish Broom*)

The Spanish Broom is one of the shrubs best suited for planting in the background in portions of the garden removed from the reach of the hose as it requires no artificial irrigation after the first year. It grows in the poorest of soil and on the dryest hillside.

Spartium junceum.

It is a native of the Canary Islands and the shores of the Mediterranean.

It gives its best effect, especially if viewed from a little distance, when growing in masses on a rocky hillside (facing the sun) and surrounded by Pines or other dark-green foliage, its bright yellow, pea-shaped flowers, which completely hide the leaves, making the color effect very striking. This is especially noticeable as it blooms in the late Autumn when few of our flowering shrubs are in bloom.

Excepting a semi-double variety, no variation in this species has yet been found.

This shrub is propagated by sowing the seeds during Winter or early Spring in the open ground or in a cold frame, the seeds being covered to the depth of half an inch. When the seedlings are four inches high they should be transplanted into pots, and, during the following Spring, set out in their permanent situations.

Spiræa

A genus comprising about fifty species of handsome flowering shrubs mostly deciduous. All are hardy, free-flowering and of easy culture, and no garden is complete without a collection of these most beautiful shrubs. They are excellent subjects for bordering groups of taller or more strongly-growing kinds which alone are apt to form stiff or too formal effects.

Spiraea.

A good collection of this genus, when well grown, will give a supply of flowers for quite a long season; for instance, Spiræa chinensis commences blooming early in March and is succeeded by Spiræa prunifolia; then follow the beautiful white-flowered sweet-scented Spiræa media, the rosy-red Spiræa japonica and the Queen of the Prairie (Spiræa lobata) with delicate peach-colored flowers, while Spiræa lindleyana, the latest flowering of all, blooms in September. These, with the addition of many varieties (including our native species Spiræa Douglasii, Spiræa Aruncus, Spiræa Millefolium, Spiræa opulifolia, Spiræa dumosa, etc.) make a most desirable collection in any garden.

The Spiræa grows freely in any good soil with ordinary care and a reasonable amount of water during the growing season. Spiræa Aruncus, Spiræa palmata and other herbaceous species prefer a damp, moist situation, particularly the bank of a stream where their fibrous roots may reach the water.

The herbaceous species are best propagated by division of the roots, and the shrubby kind either by division of the roots

or by cuttings, placed in the open ground in sandy soil in October or as soon as they shed their leaves.

Sterculia

A genus of evergreen trees or shrubs comprising about sixty species, mostly natives of Australia, Asia and South America. They form stately trees of rather formal habit of stem and head, well adapted, under suitable conditions, for making good street trees. The best species for California are Sterculia acerifolia (the Australian Flame tree), Sterculia diversifolia (from Victoria) and Sterculia platanifolia (a native of China). All are fairly vigorous and prefer a warm sheltered situation.

Propagate by cuttings of well-ripened wood placed, in September, in a cool frame and shaded during hot sunshine until rooted, or by seeds sown in Spring. Cover the seeds to the depth of one-eighth of an inch.

Streptosolen

The Streptosolen is one of the finest of our trailing or creeping shrubs and is admirably adapted for covering slopes, for hanging over walls or for carpeting the ground among tall shrubs, its tubular orange-colored flowers being very attractive.

Streptosolen.

Propagation of the Streptosolen is effected by cuttings placed in a cold frame, during October, in sandy leaf-mold. Late in the following Spring, or as soon as the cuttings are well rooted, they should be planted in pots or in the open border.

Styrax

The Styrax is one of our most desirable flowering shrubs, having leaves about three inches in length and graceful white pendulous flowers. It becomes a handsome object in the shrubbery and is good for cutting for table or hall decoration in vases.

Of this genus, Styrax serrulatum (a native of Japan) is one of the best for planting in California.

Propagate by seeds sown, as soon as ripe, one-quarter of an inch deep in light sandy loam in the open ground.

When the seedlings are one year old they should be transplanted, in early Spring, into nursery rows and set about six inches apart.

Swainsonia

A genus comprising many species of elegant hardy shrubs with rather spreading habit, which, when planted in conjunction with other shrubs having stout upright branches, form a charming combination. Being all Australian, they take kindly to our climate and should be seen more often.

Propagate either by seeds or by cuttings put in sandy soil in a cool frame any time from July to October. Cover the seeds to the depth of one-sixteenth of an inch.

Swainsonia.

Syncarpia

Syncarpia laurifolia is one of Australia's largest trees, growing in that country to the height of two hundred feet. It has a rather spreading habit of growth and prefers a warm sunny situation; as it is very sensitive to cold, it should not be planted where the thermometer falls below twenty-six

degrees Fahrenheit. It thrives in any good soil in any situation not too moist.

Propagate by seeds sown, in March or April, not more than one-sixteenth of an inch deep, in a warm greenhouse, and potted off when three inches high; plant them in permanent quarters when they are about three feet in height.

Syringa (*Lilac*)

This favorite shrub, which flowers in early Spring, should be represented in every garden however small. It grows freely in any good garden soil but will amply repay such extra attention as it may receive in the way of the removal of suckers or a little additional top dressing.

Syringa vulgaris.

There are about ten species in the genus, including the Persian (Syringa persica), the European (Syringa vulgaris), and the Japanese (Syringa japonica). These species have a number of varieties in many shades of color, varying from the deepest purple to the purest white.

The Lilac is easily propagated by means of the suckers which are produced at the base of the established plant. These should be taken from the parent plant during Winter or early Spring and placed six inches apart in nursery rows, the distance between the rows being two feet. Here the young plants should remain until they are required for permanent planting.

Tamarix

No shrub is better adapted to the planting of any waste spot or the filling up of a gap on the bank of a creek or where some other shrub has failed to grow. It stands exposure well, growing even within the spray of salt water or in alkali soil; in fact, it thrives under almost any conditions, preferring a sandy soil, however, and a situation within the influence of the sea air.

The Tamarix gallica, Tamarix orientalis, Tamarix plumosa, and Tamarix parviflora are all very desirable.

Propagate by inserting cuttings into sandy soil in the open ground in the Winter months.

Taxodium (*Swamp Cpress*)

An excellent tree for semi-aquatic situations, having a soft light-green fern-like foliage. It is very graceful in habit and highly ornamental. The genus comprises several species including Taxodium distichum (from Louisiana) and Taxodium mucronatum, the Montezuma Cypress (from Mexico).

Taxodium.

Propagate by cuttings, during the Winter months, placed in a vessel of water where they will root in a few weeks, or by seeds sown one-eighth of an inch deep in light sandy soil, and placed in a warm greenhouse in Spring.

Taxus (*The Yew*)

The Taxus comprises about eight species, natives of the Eastern States, Europe and Japan, one being indigenous to California while another is a native of Mexico.

Taxus baccata, the common English Yew, is indigenous to most of the countries of Europe and extends even to British India. It grows, under favorable conditions, to the height of fifty feet with a trunk five feet in diameter. It has many varieties, including Taxus baccata argentea (having leaves striped with silvery white), Taxus baccata aurea (having leaves broadly edged with yellow, this being a very desirable variety for planting in small grounds or for grouping among other Yews in larger grounds) and Taxus baccata fastigiata, the Irish Yew, or, as it is sometimes named, the Florence Court Yew, a species much used in formal gardens.

The Yew grows in any soil and in any situation not too much exposed to harsh winds, and while it loves a semi-shady situation on the bank of a stream, it does well under any ordinary garden conditions.

Propagate by seeds sown one-sixteenth of an inch deep in the open ground in Spring, or by cuttings inserted in September in sandy soil in a cool frame and shaded for a few weeks during hot sunshine. The variegated varieties are increased by grafting, in Winter, on the common species. They may also be propagated by layering in Summer.

Templetonia (*Coral Bush*)

A most beautiful ornamental shrub with simple leaves, a dense bushy habit and pea-shaped blossoms of bright crimson. It grows easily in any common soil and with very little irrigation, preferring a rather dry gravelly soil and a warm, sheltered situation where it well repays any attention bestowed upon it.

Propagate by cuttings placed in sandy leaf-mold in a cold frame in September.

Thuya

A genus of coniferæ comprising about a dozen species of hardy evergreen trees or shrubs, natives of America and Asia, two of them being indigenous to the Pacific Coast. Thuya gigantea, one of the Coast species, is a tall handsome evergreen graceful tree of pyramidal habit with somewhat drooping branches, and grows, under favorable circumstances, from one hundred to two hundred feet high with a diameter of stem from three to six feet, thriving well in any well-drained garden soil.

Thuya gigantea.

Propagate by seeds sown one-eighth of an inch deep in boxes filled with light sandy soil in a cold frame in early Spring. Transplant them into open nursery rows when they are three inches high, and plant them in their permanent quarters when they are about two feet high.

The Chinese species (Thuya orientalis), of a dwarf habit, is much used in cemeteries and formal gardens, its formal symmetrical habit making it a favorite in that style of gardening. Thuya occidentalis, the western species, grows to a height of about sixty feet and forms a narrow pyramidal rather compact head.

The different species have many garden varieties, and a number of them, including variegated forms, are very beautiful. These are propagated by cuttings placed in sand in a cold frame in the Fall or by grafting on the original species in early Spring.

Thuyopsis dolabrata

This small genus comprises only a few species natives of Japan. Their foliage is much like that of the Thuya but the habit is spreading and more open. They make handsome rock-work plants. They grow easily in any garden soil.

Propagate by cuttings placed in a cold frame in sandy soil mixed with leaf-mold, in October.

Tilia (*Linden*)

The Linden is one of the most desirable of the large-growing trees, being symmetrical and formal in habit, especially when young. As a single specimen on the lawn, or as an avenue tree it is unequalled. It loves a deep light loam and a sheltered site.

There are several species, one a native of the Eastern States and one of Europe. These species have a number of varieties, the leaves of some of them being variegated.

The Linden is propagated by seeds which should be sown as soon as ripe in the open ground one-quarter of an inch deep.

Torreya (*False Nutmeg-tree*)

Ornamental evergreen trees with spreading branches and dark-green yew-like foliage. The Torreyas grow well in any well-drained soil and make handsome specimens for the lawn, either singly or planted in groups. Our native species (Torreya Coulteri), the handsomest of the genus, grows to a height of about one hundred feet; Torreya grandis grows to about the same height as does also the Florida species.

Torreya Coulteri.

All are propagated by seeds planted one inch deep and three inches apart in the open ground in

early Spring. They should be transplanted into nursery rows the following Spring, and, when from eighteen inches to two feet high, should be planted where they are to remain.

Tristania

A small genus of Australian trees belonging to the Myrtle family having leaves about eight inches in length and oval in shape. When full-grown, the Tristania forms a stately tree, being evergreen with an open head, and should make a good street tree.

Propagate by seeds sown in Spring (covering the seeds very lightly with light sandy soil) or by cuttings of half-ripe wood in the Fall, placed in sand in a cold frame and shaded from sun for two or three weeks. When they are rooted, plant them in three-inch pots, giving them larger pots as the roots require.

Ulmus (*Elm*)

A genus comprising about twenty species of lofty deciduous trees, greatly used in parks and large grounds for grouping, and also as avenue and street sidewalk trees. In good soil the Elm is a rapid grower.

Ulmus.

In cultivating the Elm, care should be taken, when plowing or spading about the roots, not to injure them, for, if the least scratch or bruise is made, there shoots up a bunch of suckers which are difficult to get rid of.

Ulmus americana, Ulmus campestris, Ulmus scabra and their varieties are considered the best species for general planting.

Propagate by seeds, sown one-eighth of an inch deep in the open ground, as soon as ripe which is generally in June; or by

layers or suckers in Winter or early Spring before the buds swell; or by grafting in Winter; or by budding in May.

Umbellularia californica (*California Laurel*)

This genus contains but one species and is found only on the Pacific Coast. The Laurel is one of our grandest evergreens, being handsome even in the nursery; when from fifteen to forty feet high it forms a fine pyramid, and, when fully grown in favorable soil, is a magnificent specimen. It loves a deep well drained soil, preferably on the bank of a stream.

No evergreen tree, native or exotic, is better adapted for forming groups of dense foliage than the California Laurel if given a suitable place. In the hot interior valleys it is apt to be attacked by scale, so, on that account, should be given a shady situation and plenty of water at the roots during the dry season.

Propagate by seeds sown, in early Spring, one inch deep in the open ground. Transplant them into nursery rows when the young plants are six inches high.

Veronica

A genus comprising about one hundred and fifty species of shrubs or herbs, all being showy and free-flowering with blue, crimson or white flowers. They grow well in any garden soil in almost any situation, either in the sun or the shade, and stand exposure to harsh winds better than most shrubs. Their habit is compact and very well adapted to finishing groups of strong - growing shrubs or trees, connecting perfectly the foliage of the strong-growing upright-habit-

Veronica decussata.

ed with the grassy slope or level lawn. Their foliage is smooth, carries no dust and is always glossy and fresh looking. They flower in racemes and are always in bloom.

The shrubby species are mostly natives of New Zealand.

There are many species of this most desirable shrub, including Veronica Andersonii, Veronica buxifolia, Veronica decussata, Veronica Colensoi, Veronica elliptica, etc., all being excellent shrubs, especially for the coast counties, but they are not recommended for the central counties unless planted under the shade of trees or on a Northern exposure.

Propagate by cuttings placed in light sandy soil in a cold frame in September or October.

Viburnum

A genus comprising about eighty species of deciduous and evergreen low trees and shrubs all being hardy in California. Many of the species are highly ornamental, Viburnum Tinus being grown in almost every garden in the State, while Viburnum Opulus sterile (the Common Snowball) is also a universal favorite. No deciduous flowering shrub is better suited to the planting of shrubbery borders than the Snowball, its many varieties, its great masses of white pendant cymes in Spring, and its beautiful tinted leaves in the Fall making it most desirable.

Viburnum Tinus.

These excellent qualities, combined with its easy culture in any ordinary soil (although it prefers a moist soil and partial shade) should commend it to all lovers of flowering shrubs,

In addition to the above named, Virburnum japonicum, Viburnum tomentosum, Viburnum macrophyllum (Chinese Snowball) and several others are very effective.

Propagate by cuttings of ripe wood in the Fall, or by seeds, sown one-eighth of an inch deep in the Spring, or by layering in Summer, all in the open ground.

Virgilia lutea

The Virgilia is one of our most handsome flowering trees and blooms during August and September, when very few trees or shrubs are showing color, thus being a most desirable tree for the garden. It grows to the height of about forty feet and is of a graceful spreading habit. With its deeply cut pinnate leaves, when laden with its panicles of pale lilac-colored flowers, it makes a fine effect on the lawn or in the shrubbery. It thrives in any well-drained garden soil.

Virgilia lutea

Propagate by seeds which should be sown, in Spring, about one-quarter of an inch deep in the open ground. When one year old, the seedlings should be transplanted into nursery rows. Set them twelve inches apart.

Berried Plants

Of late years very few classes of plants have attracted such universal attention among plant-lovers in California as have the berry-bearing varieties. All of these plants bear their beautiful bundles of berries in great profusion during the winter months when flowers of other outdoor plants are scarce, for which reason they are not only exceptionally valuable in the landscape out of doors but are equally useful to the florist and decorator.

Our common Redberry or Toyon (Heteromeles arbutifolia) is a native of our own State and not hardy elsewhere in the United States (see page 141); as has been previously mentioned, it is greatly used in cut form during the Christmas and festive winter seasons and has practically become indispensable. The English Holly is likewise used very freely at that time of the year. This plant, while not a native, does exceedingly well in California, particularly in all of the coast regions, and should be used more than it is (see page 117).

When considering berried plants, we should not forget our native Madrone (Arbutus Menziesii) which bears very attractive large redberries and whose bark is greatly admired by everyone at all seasons (see page 71). The Snow-berry (Symphoricarpus racemosus) is also a native of our State and is very attractive, with its clusters of large white berries which hang on the plant in great profusion all winter long.

Pyracantha angustifolia

There are, however, two classes of plants which are very little known to the general public outside of those who are especially interested in plant life, these being the Cotoneaster and Cratægus (Thorn) families (see page 90) the majority of them being evergreen with their branches bearing wonderful bunches of brilliant berries during the winter months. All of them are exceedingly hardy and flourish in all parts of California with the exception of the cold mountainous regions. When we speak of the Thorn family of plants, we generally think of Hawthorn, which, while bearing berries, is a deciduous tree, and we are apt to overlook the fact that this family has numerous varieties, many of them, as stated above, being evergreen.

Undoubtedly the most striking variety is Cratægus Pyracantha Lalandi or Burning Bush, which, in California, bears from October to January a most wonderful crop of orange-red fruit. This variety has attracted most marked attention of late years and is universally admired; it is evergreen, is very hardy, and attains a height of from fifteen to twenty feet, forming a gorgeous feature in the landscape.

Another Thorn which is also greatly admired, and which is becoming very generally used in California is Cratægus Pyracantha angustifolia, which is also orange-berried, but which comes into fruit just after the variety Lalandi has finished its crop, the berries turning orange about the first of January and continuing during the months of January and February. It also is becoming extremely popular and is very generally used by florists and decorators whenever the branches are obtainable. This plant is evergreen and reaches a height of only about ten feet.

We also favor an evergreen red-berried Thorn named Cratægus Pyracantha crenulata and known as the Chinese evergreen Hawthorn. This plant grows to a height of ten feet and is very distinct from the preceding varieties. It is about the earliest red-berried bearing shrub, the color of the berries being fully developed by August.

The Cotoneasters form a most interesting group of plants as there is a great variety of them all berry-bearing and adapted to use in our State. One of the most striking varieties is Cotoneaster acuminata or nepalensis, which bears bright red berries during the months of November and December; it is semi-deciduous, but at the same time is a very effective plant when planted in masses as its berries may be seen from quite a distance.

For landscape effects probably one of the best of this large group of plants is Cotoneaster pannosa, a plant having a glaucous foliage, of semi-drooping habit attaining a height of only ten feet, but having its branches almost completely

covered with brilliant red berries during the entire winter season. It is a very rapid grower and hardy.

The prostrate forms of Cotoneaster are greatly prized in our landscape work and are especially useful in any rock-work effects, the most generally known varieties being Cotoneaster horizontalis and Cotoneaster microphylla. Both of these varieties bear berries in great profusion, Cotoneaster horizontalis having the more brilliant berries of the two. They are very widely planted as ground covers over banks and Cotoneaster microphylla is often planted to fall over walls and parapets in order to soften the harsh lines of concrete or stone work.

Other very useful forms of Cotoneasters are Cotoneaster frigida and Cotoneaster Francheti; the former attains a height of about twenty feet, bearing brilliant red berries, while the latter grows only about eight feet high and has orange-red berries.

There has recently been introduced from North China a low-growing spreading species, a plant discovered by Mr. Wilson of the Arnold Arboretum at Harvard University. This plant is called Cotoneaster yun-nanensis, named from the Province of Yun-nan where it is native.

CHAPTER VIII

CLIMBERS AND TWINERS

Ampelopsis

AMPELOPSIS is a genus of about twenty species of hardy deciduous ornamental climbers which grow freely in any garden soil, all being rapid growers and thriving in any position or aspect. They are excellent for training against the walls of buildings, and, when they take on their Autumn tints of bright red and yellow, present a striking appearance.

Ampelopsis quinquefolia (the Virginia-creeper) and Ampelopsis tricuspidata (the Boston Ivy) are the most useful.

The Ampelopsis is easily propagated by seeds sown in Spring one-eighth of an inch deep in a cool frame, or by cuttings of ripe wood placed in the open ground in sandy soil in September.

Aristolochia

A genus of woody twiners with irregular and grotesque flowers, one species being a native of California. Aristolochia Sipho, commonly called The Dutchman's Pipe, is a very rapid grower, sometimes making over twenty feet in a single season.

They like a warm sheltered situation and plenty of water at the root during the growing season.

Propagate by cuttings, in September, placed in pots filled with sandy leaf-mold, in a cool frame, and shaded from the sun until rooted; when they are rooted, pot them in three-inch pots and plant them out the following Spring.

BIGNONIA (*Trumpet Vine*)

The Bignonias are nearly all either climbers or twiners. They are vigorous growers and have gorgeous trumpet or funnel-shaped flowers, some of them possessing flower-tubes six inches in length.

These handsome climbers are excellent plants for covering walls, growing over old stumps of trees, forming screens or trellises, etc. They will grow in any good garden soil, preferring however a sheltered situation. A wall facing the east is adapted for their full development.

Bignonia Cherere.

This is another genus, which the gardeners of California have introduced from the greenhouses of the East and from Europe, now giving splendid effects in our favored State. Bignonia capreolata (a native of the Southern United States) is one of the hardiest and has orange-colored flowers. This species has a variety, with dark-red flowers, also a very desirable climber. Bignonia Cherere is a fine species bearing quantities of brownish-orange flowers. Bignonia diversifolia bears yellow and Bignonia floribunda purple flowers. Bignonia Tweediana, one of the best of the genus, with pretty lance-shaped leaves, has yellow flowers and is an elegant climber of rapid growth. Bignonia venusta bears glorious masses of blossoms and should be in every collection.

The Bignonia is propagated by cuttings placed in a cold frame during August or September in soil composed of one-half sand, one-quarter leaf-mold and one-quarter good loam, well mixed together, or by seeds sown, in Spring, a quarter of an inch deep.

Bougainvillea

The Bougainvillea is justly classed among the most showy of our climbers, and, when planted beside a veranda or when allowed to climb on a tall tree or building gives gorgeous effects.

Bougainvillea.

This climber delights in a warm sheltered situation and good soil with a reasonable amount of water during the summer months. There are several varieties, all of which are desirable, including Bougainvillea speciosa, Bougainvillea sanderiana, Bougainvillea glabra and Bougainvillea lateritia.

The Bougainvillea is easily increased by cuttings, put in a frame in September or March and given a little heat.

Clematis

The Clematis is among the most beautiful of our hardy climbers. The large-flowering varieties are unequaled for decorating the porch or veranda pillars. The small-flowered species, such as the Clematis paniculata, should be planted at the base of a tall tree where they send their shoots often to a height of fifty feet and form great masses of white fragrant blossoms.

Clematis.

The Clematis thrives in any good garden soil but prefers a light sandy soil well enriched by old manure and plenty of water during the growing season. Should any signs of mildew appear, dust with flowers of sulphur at once, so as to stop the mildew from spreading. All the Clematis flower better if severely pruned each Fall or Winter before growth commences.

Propagate the finer varieties by cuttings or by grafting on common stock in Summer.

Cobæa scandens

The Cobæa is a rampant-growing soft-wooded climber with bell-shaped flowers, thriving well in any good soil but preferring a sheltered, sunny situation.

Propagate by seeds sown, in February, one-eighth of an inch deep in a hotbed, and potted off in three-inch pots. As soon as the young plants have filled the pots with roots, gradually harden them by placing the pots in a cold frame; in May, plant them out where they are to remain.

Dolichos

The Dolichos is a free-growing ornamental twiner with pea-shaped flowers and pretty light-green foliage, growing freely in any soil and thriving either in the sun or in the shade.

Propagate by seeds sown either in the open ground in early Spring or at any season under glass. Cover the seeds to the depth of one-sixteenth of an inch.

Eccremocarpus

A genus of elegant hardy evergreen climbers with yellow or orange-red flowers tubular shaped. The leaves are compound with oval-shaped leaflets. They are excellent for covering fences, walls, etc., growing freely in any soil.

Propagate by cuttings placed in a cold frame in August or September; shade them during sunshine until the young roots are formed, when they should be potted off into three-inch pots.

Hedera Helix (*Ivy*)

Few climbing plants will be found more useful than the old-fashioned Ivy as it grows in any soil and almost any aspect. It is good for covering walls, railings or rustic houses, and makes excellent bordering for walks or a covering for bare spots under trees where few other plants will grow. Should the leaves get dusty, it is a good plan to clip off all the leaves annually, about the end of March or just before the Spring growth begins, and in a few weeks the old leaves will be replaced by a new crop of bright clean foliage.

Propagate by cuttings placed in the open ground in October or November; in a few months they will be rooted and ready to be planted in their permanent places.

Ipomœa

The Ipomœa is an extensive genus, having over four hundred species of twining or creeping plants whose campanula or salver-shaped blossoms are of all shades of purple, red, blue or white. They are among the prettiest of plants for covering the limbs of old trees, trellises, veranda pillars, etc. All of the species may be easily raised from seeds which should be sown in early Spring, one-eighth of an inch deep in four-inch pots filled with good loam mixed with about one-third sand; sow three seeds in each pot and place the pots in a warm place under glass. When the young seedlings are about six inches high they should be tied to small temporary stakes and gradually hardened by exposure to the open air; after two weeks' exposure to the open they are ready to be planted out.

Jasminum

The Jasminums are well-known plants and are very popular on account of their elegant habit and sweet-scented flowers. They make excellent covering for fences, trellises, arbors, etc., and thrive in any good garden soil.

Jasminum nudiflorum is one of our earliest Spring-flowering plants, often opening bright-yellow flowers as early as January. Jasminum officinale, the fragrant common Jasmine, blooms continuously from early Summer until late in the Autumn.

Propagate by layers laid in, an inch deep, in ordinary soil in June, or by cuttings of the ripe wood, in September, inserted one inch deep in sandy soil in a cold frame or in the open ground; select shoots not showing flower at the top.

Kennedya

The Kennedyas are rapid-growing hardy twiners, natives of Australia; they like a warm sunny situation. They bear pea-shaped flowers, reddish-brown or scarlet in color. Any good garden soil will grow them well.

Propagate by seeds sown, in early Spring, one-quarter of an inch deep in a warm greenhouse or hotbed; when they are large enough to be handled, pot them singly in three or four-inch pots; gradually harden them by exposure to the open air and plant them out when they show signs of making fresh growth.

Lathyrus odoratus (*Sweet-Pea*)

This general favorite is a native of the Mediterranian islands and consequently is at home in the climate of California. It thrives well in any good garden soil, but, in order to obtain the best results the soil should be trenched two spades in depth and four inches of old manure mixed with the soil.

Lathyrus odoratus.

In addition to its value as a garden plant, the Sweet-Pea makes a very good window-box plant, its fragrant many-colored flowers spreading a

pleasant odor throughout the room when it is thus grown.

In planting the Sweet-Pea seeds, form with a hoe or shovel a shallow furrow about two feet wide and three inches deep, in the middle of which draw the seed-drill three inches deep. In this seed-drill the seeds should be planted about three inches apart. When the young plants are six inches high, place a row of tree limbs or a fence of wire netting alongside them so that they may have something to climb over. Also spread a mulch of manure about the plants; this will keep the ground cool and preserve the moisture. Where a succession of bloom is desired, the seeds should be sown about three times a year. Seeds which are sown during Winter or early Spring should have a covering of soil one inch deep while those sown in Summer or early Fall should be covered to the depth of from two to two and a half inches and shaded with a light covering of straw or some other light material until the seeds come through the surface.

Lonicera (*Honeysuckle*)

The Honeysuckle is an extensive genus, comprising over eighty species of hardy deciduous or evergreen shrubs or climbers with tubular-shaped flowers, many of them delightfully fragrant. They are well suited for covering walls, arbors and trellises or for mixing with shrubs where they give charming natural effects, twining, as they do, around the stems and forming a carpet to the ground under the shrubs.

Lonicera.

The fragrant-flowered deciduous English or common

Woodbine and the evergreen Japanese species are among the best of the genus.

Propagate by cuttings of the ripe wood inserted in the open ground in the Fall.

Mandevilla suaveolens

The Mandevilla is one of our most handsome climbers, its elegant twining habit and its pure white flowers making it very desirable for training against walls or trellises. It thrives in any good soil but should not be grown in cold exposed situations.

Propagate by seeds sown one-eighth of an inch deep, in heat in early Spring; plant them singly in small pots as soon as they are large enough to be handled; gradually harden them and plant them out in early Summer.

Mandevilla suaveolens.

Maurandia

The Maurandias are very pretty climbers with small heart-shaped leaves and funnel-shaped flowers. They are easily grown if given a sheltered spot away from harsh winds.

Propagate by seeds sown, in March, one-sixteenth of an inch deep, in a cool frame or greenhouse; when they have made four leaves, transplant them into either pots or boxes; after gradually exposing them to the open air to be hardened, plant them where they are to remain.

Muehlenbeckia

This is a genus comprising about fifteen species of hardy shrubs, mostly natives of Australia and New Zealand. They are of very easy culture, thriving in any fair garden soil and a sunny situation.

Muehlenbeckia complexa is one of the best of our hardy climbers, being excellent for growing over rocky ledges, old stumps, etc., for hanging or drooping over the rims of vases or for hanging over walls. Its habit is dense. On account of its distinct form, the brownish color of its leaves and its heavy spray-like branches it is very valuable for cutting.

This climber is propagated by cuttings placed in a cold frame in September and shaded during sunshine until well rooted.

Muehlenbeckia complexa.

Passiflora

A large genus of highly interesting climbers of rapid growth, mostly natives of tropical America. They are noted for their elegant habit and gorgeous flowers, making grand effects when planted at the base of an old Pine or Oak tree and allowed to twine along the branches of the tree and to hang down in long pendants laden with their gaily-colored oddly-shaped flowers.

Propagate by cuttings placed in light sandy soil in a cold frame in September; pot them into three-inch pots and plant them out in the early Spring.

Solanum

The Solanum Wendlandii is one of the best of the climbers, no one of its color giving so good results when it has been put in a suitable place, its lilac-blue flowers producing gorgeous effects for several months of the year. It delights in a well-protected sunny situation and a fairly good soil.

Solanum jasminoides (the common Potato Vine) is also very desirable. This species is much hardier than the former and will grow well in almost any soil or situation, preferably however at the base of an old tree; hanging from the branches it is very effective.

The Solanum is propagated by cuttings which should be placed in sandy soil in a warm frame in August.

Wistaria

This beautiful Spring-flowering climber is so well known as hardly to require any description. The genus contains

Wistaria.

about five species. Wistaria speciosa is a native of North America and blooms a month later than Wisteria sinensis, a native of China, which is the species most grown. Wisteria japonica and Wistaria multijuga (the former bearing white flowers and the latter lilac flowers with purple wings) are natives of Japan. These again have varieties which bear double flowers.

The Wistaria delights in a light and rich soil, and, if given this, will produce branches sometimes a hundred feet in length on each side of the main stem, giving gorgeous masses of bloom in the early Spring.

The Wistaria forms great bundles of small growths which often become matted under the eaves of buildings or about the stems of old trees. Where they grow freely, these matted growths should, in Winter, or before growth commences in early Spring, be carefully disentangled and all of the weaker growths should be pruned back to a strong spur or bud, the remaining branches being laid in and fastened by ties to the wall or other support, not closer together, however, than twelve inches.

Propagation of the Wistaria is effected most easily by seeds sown during early Spring, one-half of an inch deep, in a warm frame or greenhouse, or by layering in June.

CHAPTER IX

BULBOUS AND TUBEROUS-ROOTED PLANTS

Agapanthus

The African lily is one of our favorite bulbous-rooted plants, with luxuriant yet graceful foliage and great umbels of bright blue or white flowers in clusters of from twenty to thirty measuring over a foot across. It makes a fine showing in the flower-border or on the lawn. It thrives best in deep rich loamy soil, well enriched with manure, and can hardly receive too much water during the growing season.

Propagate by offsets or by dividing the old plants into single crowns and planting them in March.

Agapanthus.

Amaryllis

The Amaryllises are among the most gorgeous of our bulbous flowering plants. Some of the genus, such as Amaryllis Belladonna, have the flowering season over before the leaves appear. Their tall stems (large heads of fragrant and beautiful pink flowers) make them great favorites for cutting and for filling vases. They delight in soil of a light rich nature, in which they should be planted about eight inches deep and left undisturbed for years, where they will ultimately establish themselves and produce grand masses of bloom. During dry weather and until they have perfected their foliage, they should be given an abundance of water, after which they do not require so much, and it may gradually be withdrawn altogether.

Vallota purpurea and Imantophyllum miniatum will be found to do excellently if given a warm sheltered situation and a rich loamy soil. Plant the Vallota bulbs six inches apart and the Imantophyllums twelve inches apart, one-half of the bulb being above ground.

Propagate by dividing the bulbs and planting them in March, or by seeds collected as soon as ripe in the Fall and sown in a warm, sheltered border or cold frame in early Spring; cover the seeds to the depth of about a quarter of an inch.

Calochortus (*Mariposa Lily*)

Handsome native bulbous plants with showy flowers and erect flower-stems. There are about twenty varieties, all of which are very beautiful. They require a good strong loam of considerable depth to grow well. Pasture fields are the native homes of the Mariposa Lilies.

Propagate by seeds sown, in early Spring, in light loam, covering the seeds to the depth of one-eighth of an inch, or by division of the bulbs which should be taken up as soon as the leaves turn yellow and the bulbs are in a dormant state. Keep the bulbs in a cool dry position covered by light loam or sand to prevent them shrinking, as leaving them all Winter in paper bags or in dry sheds seems to dry them too much and to weaken their growth the following year. Plant them immediately after the first Fall rains, from six to twelve inches apart and from two to three inches deep. Select a spot away from artificial irrigation. On no account disturb the bulbs and they will give improved flowers year by year.

Crocus

This well-known genus is among the earliest of our Spring flowers, often opening its flower-scapes the first week in January. It prefers a light, rich, loamy soil and a sheltered situation.

After they are done blooming and the leaves turn yellow, the bulbs should be taken up.

Propagate by dividing the bulbs when they are in a dormant state; keep them, in a cool dry place, covered with dry soil until the next planting season in October or the early part of November; plant them about three inches deep.

The Crocus may also be propagated by seeds sown about a quarter of an inch deep, as soon as ripe or in early Spring, in light rich soil, and left in the seed-bed for two years when the young corms may be separated and transplanted.

Hyacinth

In the cultivation of this handsome bulbous plant, a light rich soil should be provided, and firm, solid bulbs of good size selected; soft spongy bulbs give weak stems and poor flowers. Plant the bulbs about eight inches apart and three inches deep, placing a little sand in the hole before planting. The latter end of October or the first week in November will be found the best time to plant. As soon as the flower-spikes are from six to eight inches high they should be neatly staked to prevent the flowers being broken by their own weight; should the weather continue dry in Spring or while they are in bloom, they should be watered freely as any dryness at the root will weaken the growth and shorten their season of bloom. As soon as the foliage is ripe or turned yellow in color, the bulbs should be taken up and the foliage cleaned off; when they are thoroughly dry, they should be packed in boxes filled with dry soil and laid away in a cool dry place until the following season.

Propagate by dividing the bulbs, taking the offsets from the old bulbs as soon as they are taken up; place the offsets in separate boxes and plant them, in small beds or borders, two inches deep in light rich soil. They flower the third year.

Iris

The Iris belongs to a genus of over one hundred species of hardy herbaceous plants with creeping or tuberous root-stocks. The Iris is found naturally all over the Temperate Zone, in America from Canada to California, and in Europe from Russia to sunny Spain, while the gorgeous Iris Kæmpferi and Iris tectorum come to us from Japan; others are natives of Siberia, and quite a few are from China.

Iris.

The Iris delights in a deep rich clayey soil preferably alongside the bed of a stream or canal or on the banks of a pool or lake where the moisture rises within two feet of the surface. If these conditions are not available, a bed should be prepared by trenching the soil two feet deep and mixing the soil freely with old decomposed manure.

Plant the bulbs or roots so that about one inch of soil covers the crown, and give them water copiously during the growing season.

Iris germanica, Iris florentina, Iris susiana, and the dwarf Iris pumila, besides many others, are well worthy of prominent positions in our gardens and pleasure-grounds.

Propagate by division of the roots or bulbs in early Spring, or by sowing the seeds in light sandy soil in either a cold frame or a sheltered border as soon as the seeds are ripe. Cover the seeds a quarter of an inch deep.

Ixia

This beautiful Spring-flowering bulb is most useful for giving a fine effect in Spring and early Summer from its elegant habit, its graceful flower-stalks and its rich and varied colors, the center of the flowers always differing in shades from the other parts.

The genus contains about twenty-five species of easy culture in any good garden soil.

In October or early in November plant the bulbs about six inches deep; as soon as the leaves turn yellow take up the bulbs and store them in a cool dry place until the next planting season.

Propagation by offsets is the quickest method of increasing the number of plants; they may be secured in quantity after the parent bulbs have ripened off; store them in a cool dry place until the planting season; plant the offsets in a sheltered position about three inches apart for one season; the second year they will bloom and may be planted in their blooming quarters.

They may also be propagated by seeds which should be sown in pans or boxes about September and placed in a cold frame; cover the seeds to the depth of one-quarter of an inch; the second year plant the young bulbs a few inches apart in a sheltered spot, taking up the bulbs as soon as ripe and storing them until planting time. They will bloom the third year.

KNIPHOFIA (*Red-hot Poker plant*)

This handsome stately herbaceous plant is a general favorite on account of its striking color and adaptability to almost any soil or position, doing well in poor soil although it prefers rich loam. Even on our rocky dry hillsides it struggles along and boldy sends up its large tufts of long narrow leaves and stately flower-stalks covered with scarlet or yellow blossoms until late in the season.

Propagate by dividing the crowns in early Spring, planting them where wanted to flower, which they will do the succeeding Summer and Fall. Cover the crowns to the depth of one inch.

Lilium (*Lily*)

Lilies are matchless among hardy bulbs for beauty of form and variety of color and also for the length of their blooming season. They delight in a cool fresh soil and a sheltered semi-shaded situation; grouped among tall shrubs they show to good advantage. After the stems are well-formed and about one foot high, give them a good top-dressing of well-decomposed manure about three inches deep all over the surface of the ground, and abundance of water until the flowering season is over when water should be gradually withdrawn so as to encourage the ripening of the bulbs.

They are increased by taking the small bulblets which form about the old bulbs (as soon as the bulbs are ripe which is shown by the leaves and stems turning yellow and dropping off) and planting them half an inch deep in separate beds in light rich soil, growing them on until they are large enough to bloom, when they may be planted out in the beds or borders where they are to flower. When the young bulblets are taken up they should be transplanted into their new quarters without any delay, as exposure to drying wind or being allowed to lie any length of time in a dry atmosphere (even if in a shed or shaded situation) has a weakening effect on their future growth.

With a good selection of the many gorgeous species, Lilies may be had in bloom for several months. Among the earliest-flowering kinds may be mentioned Lilium candidum (St. Joseph's Lily) and our splendid natives Lilium washingtonianum, Lilium pardalinum and Lilium Humboldtii; following them, Lilium tigrinum, Lilium lancifolium and its varieties the splendid Lilium auratum and the tall and stately Lilium giganteum, besides many others equally beautiful.

Montbretia

This hardy free-flowering bulbous plant is a native of South Africa and grows to the height of about two and one-half feet. It thrives well in any good garden soil and increases rapidly, its roots spreading freely. It requires little attention beyond getting a plentiful supply of water until the blooming season is over when the water may be gradually withdrawn. It should be taken up and replanted about March in every third year. The roots get so thickly matted together by that time that the ground becomes impoverished, the result being small and imperfect flowers and foliage. TheMontbretias make excellent plants for carpeting in groups of young shrubs which still show bare ground between the plants.

Propagate in early Spring by dividing the roots and planting them twelve inches apart in bunches of from three to six bulbs each. Cover them to the depth of half an inch.

Narcissus (*Daffodil*)

A genus of popular hardy Spring-flowering plants with handsome white or yellow flowers. They are excellent for filling beds or borders and make fine effects when planted in apparently natural groups in the lawn.

Narcissus.

When planting them in the lawn, avoid symmetrical lines or formal shapes as far as possible, a good plan being to take the bulbs in the hand and to scatter them freely, planting them where they fall. When planting in the grass, take up a piece of the sod about three inches in diameter and six inches deep; in the bottom place about an inch of light rich soil, then plant the bulb, fill in another three inches of soil, and, on

top of this, replace the sod which should be root-trimmed to one inch thick, leaving the lawn level and smooth as before digging.

When planting groups in the herbaceous or mixed border, if possible give them a partially shaded situation, making the groups of irregular outline and seeing that each group contains one variety only.

The best soil for the Daffodils is a deep rich brown loam which has been freely manured the previous Spring, and from which a crop of some annual flowers has been gathered. In August, after clearing off the asters, stocks and other Summer-flowering plants, spade the ground over to the depth of at least one foot, leave the ground open for two or three weeks, rake the surface over and plant the Narcissus bulbs from four to six inches deep and from eight to twelve inches apart.

As soon as the flowering season is over, and the foliage is ripe, which will be shown by the leaves becoming yellow, the bulbs should be dug up and stored away (after removing the dry leaves) in boxes filled with dry soil and kept in a cool dry cellar until September or October, when they should be replanted where they are wanted for effect the following Spring, or, if the space is not required, the bulbs may be left in the ground and will give good results the following season.

The usual mode of propagation is by offsets which should be separated from the parent bulbs during the dormant season and planted out separately for a year in order that they may grow large enough for flowering. They may also be raised from seeds but the process is a slow one. The seeds should be sown as soon as ripe a quarter of an inch deep in light loamy soil, in pans or boxes; the second year plant out the young bulblets about two inches apart and a quarter of an inch deep in a prepared border. The third year plant them in their flowering quarters as before directed.

Narcissus Jonquilla (*Jonquil*)

Jonquils are now classed under the head of Narcissus, thriving under the same treatment as the daffodils. Although not so large-growing as some of the daffodils, they are much admired for their delicate fragrance and the bright golden color of their long narrow tubular necks and their saucer-shaped crowns.

They should be planted about the middle of November.

Polianthes tuberosa (*Tuberose*)

This beautiful Autumn-blooming tuberous-rooted plant is a native of our sister republic, Mexico, and thrives well in our warmer valleys and in sheltered situations in the coast counties. It prefers a sandy loam generously enriched, which should be well-cultivated by the soil being stirred and the surface hoed after each watering. Plant the tubers twelve inches apart, in early Spring, about one inch of soil covering the bulbs. They are much used in planting in clumps in flower-borders and shrubberies.

Propagate in Winter by dividing the bulbs.

Ranunculus asiaticus

There are two forms of this lovely Spring-flowering Ranunculus, viz., the Persian and the Turban. The Persian has a compact symmetrical habit, the Turban being more spreading and larger every way; the flowers of both sections are very beautiful and they both make excellent bedders. Both have numerous varieties and range in color from white, through all shades of browns and yellows, to scarlet, or they are speckled and striped most charmingly.

They thrive best in a rich light soil well mixed with old cow-manure; they should be carefully watered during dry

weather—not overwatered, however, as they abhor stagnant moisture, too much water causing their foliage to become yellow and the flowers to become weak and short-lived.

As soon as the flowering season is over and the leaves are ripe, take the roots up, remove the foliage, dry the little bulblets and store them away in boxes filled with dry soil in a cool cellar until planting time arrives which should be in November. In planting, set them out about six inches apart and two inches deep, care being taken to plant them with their crowns uppermost.

Propagate by dividing the claw-like tubers as soon as ripe, which is generally early in June. They flower the second year.

Richardia aethiopica (*Calla Lily*)

This genus comprises five species of hardy South African Aroideæ, all having handsome foliage and tall-growing elegant flower-spathes. They are of easy cultivation if given plenty of moisture; a light sandy soil, if well manured, suits them very well, but they also seem to thrive in heavy muck or loam if given plenty of water, or if partially submerged and treated as a semi-aquatic.

Propagate by offsets or by dividing the roots, in Winter or early Spring; plant about one foot apart, covering the tops one or two inches deep.

Scilla (*Wood Hyacinth*)

The Scillas are among the most beautiful of our hardy Spring-flowering plants. Some of the species, being natives of Spain and Portugal, are specially adapted for growing here in California. They thrive well in any good garden soil, although soil of a light sandy loam seems to suit them best. In September, plant them six inches deep where wanted to

Cocos plumosa as Sidewalk tree.

bloom, selecting any out-of-the-way spot under the shade of trees, even the shade of the heaviest Pines, where few other plants will thrive. There are several fine species including many colors.

Scilla campanulata and its variously-colored varieties make charming and effective groups in flower-borders and shrubberies.

Propagate in the dormant season by separating the offsets from the parent bulbs and growing them on in a separate bed or border for one year. The following season they should be ready to be planted where they are to bloom.

Tigridia

Few flowers are more gorgeously colored or more beautiful than this hardy vigorous-growing bulbous plant. It thrives well in any good soil and a warm sheltered situation. Plant the bulbs about three inches deep and six inches apart, in September or October.

Propagate either by seeds sown in early Spring, covering the seeds about a quarter of an inch deep, or by offsets taken from the old bulbs during the dormant season.

Tulips

These well-known hardy Spring-flowering bulbs are very popular for the decoration of our gardens, and, where a good collection is grown, may be had in bloom from February to June. They thrive well in any good light loam, and, in October or early in November, should be planted from three to four inches deep where they are to bloom; plant them, with a trowel, about eight inches apart.

After they have finished blooming, and their leaves become brown, the bulbs should be taken up from the soil and laid singly in a cool shaded airy shed until thoroughly ripened, when they should be stored in shallow boxes and placed in an airy dark dry cellar until the planting season.

In planting, care should be taken to plant in the same bed those varieties which bloom early, the same rule being followed with those which bloom later, for, if the late-blooming varieties were planted among those which flower in February or March, the result would be disappointing as the early species would be out of flower and their foliage would be brown before the late-blooming species began to show color.

Propagate by offsets taken from the parent bulbs when they are lifted; these offsets should be grown by themselves until large enough for flowering.

CHAPTER X

PALMS

Areca sapida

THIS very ornamental genus of Palm is a native of New Zealand and is not hardy where the temperature falls below twenty-eight degrees Fahrenheit. From Santa Barbara south it forms grand specimens, and also in some favored localities farther north if planted under the shade of other trees and away from cold draughts. It thrives best in a light sandy soil well enriched with old well-decomposed manure.

Propagate by seeds sown, in February or March, one inch deep in a hotbed or in a warm greenhouse. When the seedlings are about four inches high, plant them in three-inch pots and give them more room as growth advances.

Chamærops

The Chamærops are among the hardiest of our fan Palms while they are also free-growing and easily transplanted. Chamærops humilis, which is a native of the Mediterranean regions, is of a dwarf habit; Chamærops excelsa, which is from China, is of a more stately habit, sometimes attaining a height of thirty feet and growing handsome crowns of deeply cut fan-shaped leaves.

They delight in plenty of water and a well-drained soil.

Propagate by seeds sown one inch deep, in heat, in early Spring; when they are four inches high, pot them in three-inch pots; when they are one year old, plant them in the open ground in nursery rows. They may also be propagated by suckers taken from the base of old plants in early Spring.

Cocos

Cocos australis, the hardiest of the genus, is worthy of more attention from planters than it has received in the past and should do well in all of our valley counties. Cocos plumosa, a native of Southern Brazil, does surprisingly well in Southern California from Santa Barbara south, where avenues of them may be seen. They frequently attain a height of forty feet and make grand objects of stately beauty.

Propagate by seeds planted, in March, one inch deep in a warm greenhouse and grown on in pots until four feet high when they may be planted out of doors in a situation protected from frosts and harsh winds, until large enough to be planted in their permanent quarters.

Erythea

The Erytheas are natives of this coast and perfectly hardy in all the valley and coast counties, so grow well in any garden soil with ordinary treatment.

Erythea armata, commonly called the Blue Palm, is of slow growth and very distinct in habit and in the color of its leaves which are of a bluish grey and deeply cut. Erythea edulis is a much quicker grower, having larger leaves of deep green.

Propagate by seeds sown, in Spring, one inch deep in a warm greenhouse or in a mild hotbed and grown in pots for at least one year when they may be planted in the nursery.

Jubæa

Jubæa spectabilis or Wine Palm of Chile is one of our hardiest palms, growing well even in San Francisco. It has much the same habit as the Date Palm family but differs from them in its closer habit and heavier foliage, being an excellent palm for small gardens as it is of slow growth and formal habit and is not particular as to soil.

Natural Group of Washingtonias (Calfornia Fan Palms).

Propagate by seeds sown, in early Spring, one inch deep in a hotbed or warm greenhouse; give pot room as required.

Livistona

A genus of palms comprising several species all bearing handsome fan-shaped leaves.

Livistona australis is hardy as far north as San Francisco. Livistona chinensis, not being so hardy, should not be planted out of doors north of Santa Barbara unless well-sheltered and partially shaded.

Propagate by seeds sown in heat one inch deep, in early Spring. When the seedlings are about four inches high, plant them in light rich soil in three-inch pots. Transplant them into larger pots as the young plants require the space.

Phoenix canariensis.

Phœnix

The Phœnix canariensis is without doubt the most hardy and most popular of the genus, growing well in any garden soil and standing considerable exposure to wind. Phœnix reclinata is also very popular. It is elegant in habit but not so vigorous a grower as the preceding, requiring a sheltered situation away from harsh winds and frost. There are several other species such as Phœnix rupicola, Phœnix sylvestris, Phœnix zeylanica, Phœnix dactylifera, etc., all fairly hardy and easily grown.

Propagate by seeds sown, in early Spring, one inch deep in a hotbed or in a warm greenhouse. Plant them in three-inch pots when the seedlings are about four inches high, and give them more room as growth advances.

Rhapis

The Cane Palm of Japan is an elegant dwarf-growing palm with cane-like stems and crowns of palmate leaves, admirable for pot culture and for places in rooms or verandas. If planted out of doors it should be given a shaded sheltered situation free from draughts or cold winds. There are several species and varieties of this most interesting palm all worthy of a place in any collection.

Propagation is effected by division of the roots in early Spring.

Sabal Palmetto

The Cabbage Palm of Florida is another of the fan palms which do well in our gardens and should be found in every good collection. It is hardy, standing considerable exposure and is not particular as to soil.

There are several species belonging to the genus such as Sabal blackburniana, Sabal mexicana, Sabal umbraculifera, etc.

Propagate by sowing the seeds one inch deep, in early Spring, in a warm greenhouse; pot them when four inches high, and give them more room both at top and root as required.

Seaforthia elegans

The Seaforthia is one of the most elegant and free-growing of the palm family. From Santa Barbara south it is perperfectly hardy, ripening its seeds in the open air.

Propagate by seeds sown one-half inch deep in Spring, the seeds starting freely and growing rapidly in a warm greenhouse or hotbed; transplant them into three-inch pots when they are from four to six inches high and give them more pot room as required.

Washingtonia

The well-known California Fan Palm is without doubt the stateliest of all our palms whether native or introduced. It delights in a good soil, deep and well drained, and a plentiful supply of water at the root during the growing season.

Washingtonia filifera is not recommended for cold exposed situations in San Francisco, the Summer being too cold for its making vigorous growth, but south of San Francisco and in the interior counties as far north as Butte county it is perfectly at home and grows vigorously. Washingtonia Sonoræ is much more hardy, growing well even in San Francisco.

Propagate by seeds sown, in early Spring, one-half inch deep under glass and kept in pots until one year old; they may then be planted in the nursery and left there until large enough to be planted in their permanent quarters.

CHAPTER XI

FERNS

IN THE formation of a Fernery, a location partially shaded and yet not exposed to draughts or harsh winds should be selected.

A situation facing East or a Northerly slope suits the great majority of hardy Ferns, and, as they are generally found as undergrowth in woods or rocky ledges, on the banks of streams or creeks, or in shady spots in marshy ground, these conditions should be imitated as closely as possible, a rocky dell shaded with deciduous trees being an ideal spot in which to establish a Fernery.

Of course many of the hardier, stronger growers do fairly well under practically any tree or in partial shade of almost any kind, but a situation, such as has been described, will be found from results to be very much the best.

The decision as to the selection of the site may be influenced by whether the intention is to plant the Ferns on the ordinary ground level or to have a Rock Fernery.

If the Ferns are to be planted without introducing rocks or stumps, all that is necessary is to see that the soil is of the proper character. It should be light, rich and porous, so that water will pass through it freely. If the natural soil is heavy loam or of a clayey nature, it should either be removed to the depth of one foot, and a foot of light soil filled in, or the foot of light soil should be spread over the surface of the original ground.

The very best soil for growing Ferns is composed of one-quarter peat, one-quarter sandy loam, one-quarter sharp sand and one-quarter leaf-mold, all having been thoroughly mixed together a month before being used.

Group of Tree Ferns.

Should a Rockery effect be desired in conjunction with the Fernery, place the rocks (which should be if possible of a porous nature) on top of the soil, allowing a layer of soil of at least one-half of an inch to lie between each rock; avoid building the so-called pockets into the Rockery as this invariably leads to sour soil, and sour soil means sickly plants

The comfort of the plants should be the first consideration and should not be sacrificed to the appearance of the rockwork.

When the rockwork is finished, the plants should be got together and a system of planting laid out. The larger Ferns, including the Tree Ferns, should first be arranged and planted; afterwards those of medium growth should be placed in their positions, and then the smaller and dwarf kinds.

The best Tree Ferns for the beginner to experiment with are the Dicksonia antarctica and the Alsophila australis as they are both vigorous growers and are among the noblest and most beautiful of any. When planting, set them out in group-form irregularly and from five to ten feet apart; under and among them plant such kinds as Woodwardia, the stronger growing Asplenium, Polystichum, Lastrea, Polypodium, Osmunda, Blechnum brasiliense, Pteris tremula, and also our native Sword Fern. Then, to finish the group, plant, near the walk, the smaller and dwarf species such as the Five-finger Fern, the Deer Fern, Blechnum Spicant, Scolopendrium, Adiantum Capillus-veneris, Cystopteris fragilis, Woodsia, etc.

The most of the foregoing are evergreen, delighting in perpetual moisture, and should be given every attention in the way of watering, their roots never being allowed to get the least dry. During dry weather they should be sprinkled at least once a day overhead, water that is not too cold being used; water drawn direct from city mains or from artesian wells is much too cold for use in sprinkling or watering ferns or other delicately foliaged plants. Especially should care be taken in watering the smaller kinds which should always be

watered with the watering-pot, the water having been aerated and warmed by contact with the atmosphere before being used.

The season for planting is from November until growth commences, which is generally in February. When planting, see that the soil is of the nature recommended; plant moderately firm and not too deep.

Ferns grown in pots require repotting more or less frequently. This must be very carefully done, it being remembered that these plants make their most luxuriant growth after they have covered the inside of the pots with a network of their roots. The repotting may be done at any season, but early Spring, just before growth commences, is regarded as the best season for the work. In repotting, see that the pots are clean and dry; should new pots be used, they must be put in water and allowed to remain there a sufficiently long time to become thoroughly soaked; they should then be well dried before being used. New pots absorb great quantities of water, and, unless they are well soaked before being used, it often happens that the first two or three waterings, instead of watering the roots of the plant, serve to only soak the pot, while the balls of earth, which the pots contain, become so dry that it is difficult to again get them moistened. When preparing pots, see that the proper amount of drainage is put in. First place one piece of broken potsherd over the hole in the bottom of the pot, then fill the pot about one-fifth of its depth with clean, broken potsherds; cover this drainage material with moss to keep the soil from mixing with it. The soil should consist of two parts sandy fibrous loam, one part of leaf-mold and one part of peat with enough coarse sharp sand to keep the whole open and porous.

Ferns and Grasses in Rockery.

CHAPTER XII

BAMBOOS AND GRASSES

THE Bamboo is a general favorite with all lovers of beauty of form in plant life. It is an evergreen indigenous plant belonging to the grass family. The Bamboo delights in a light, rich soil, a well-sheltered situation and plenty of water at the roots during the growing season, but stagnant water is fatal to it. The bank of a perennial stream and the side of a sheltered lake or pool, where the crowns are planted a foot or two above the water level, are ideal spots for the growing of the Bamboo, while a good mulching of well-rotted manure once a year encourages the plants to send up strong and graceful stems. The more sheltered they are from wind the better; especially must they be protected from our strong Summer west winds. A background of our native Pinus insignis or any deep-green tree or shrub, shows off the Bamboo to very good advantage, or, if a more graceful combination is desired, the Bamboo can be mixed with the Birch, and the effect will be most pleasing, especially if the golden-stemmed Bambusa aurea is used and the group is a large one.

In planting the Bamboo in groups, it is inadvisable to plant the strong rampant growers, such as Arundinaria Metake, etc., along with the more flexible Phyllostachys Henonis or any of the non-suckering species, as the spreading rhizomes of the strong growers will run into the roots of the more delicate kinds, rob them of their required sustenance and eventually starve them to death.

For single specimens on the lawn in sheltered nooks, the Arundinaria falcata is one of the most graceful; it grows to the height of about twenty feet, each stem drooping gracefully from the center and forming a very pleasing effect.

The Bambusa family is divided into several sections. The Arundinaria has a straight round stem which the branches nearly encircle. These appear simultaneously along the whole length of the stem, and at each joint, the sheaths of the young branches being carried until late in the season, this giving a rather unkempt appearance to the plant; Arundinaria Simoni and Arundinaria japonica seem to carry them much longer than the other species.

The Phyllostachys, on the contrary, begin to open their branches at the lower end of the stem and gradually develop them upwards. The Phyllostachys also, instead of having a perfectly round stem, have a double furrow along the stem, this being caused by the pressure of the branches against the stem while in a soft state.

Propagate by division of the roots and by cuttings. The best time to propagate the Bamboo by division of the roots, which is a very simple process, is in the end of March. The plants should be taken up and divided into small clumps of two or three stems each with their jointed roots attached (there being left as much earth around the roots as possible) and planted about two feet apart, in good, fresh, light loamy soil. They should be given a good watering and a mulching with half-rotted manure. They may be planted at once where they are to remain.

Propagation by cuttings is effected by taking up the underground stems, or rhizomes as they are called, in March or April, cutting them into lengths of from six to eight inches, planting them in light sandy loam, about four inches deep, and giving them water as required. See that only roots of the previous year's growth are used as all older rhizomes will be failures, only the young rhizomes being reproductive.

Among the species which thrive well and are perfectly hardy may be mentioned the Arundinaria falcata, Arundinaria Hindsii, Arundinaria Simoni, Arundinaria japonica, Phyllostachys aurea, Phyllostachys Henonis, Phyllostachys nigra, Bambusa marmorea, Bambusa quadrangularis and

Bamboos.

Bambusa palmata while many others are worthy of a choice place in our gardens.

Groups of Mixed Grasses

Very pretty combinations can be made by planting mixed grasses; for instance, by planting one or more of the Bamboos in the center of the group, with a line of the stately Arundo Donax and Arundo conspicua alternately around the Bamboos, and, in front of and around the Arundo plants, a line of the Pampas Grasses, then, in front of and around the Pampas Grasses, a row of Eulalia japonica and its varieties intermixed perhaps with Erianthus Ravennæ, finishing the group with Orchard Grasses and Feather-Grass (Stipa pennata).

Other and smaller groups can be planted, leaving out the stronger growing, or handsome groups can be formed, leaving out the dwarf growers, or again, a carpet can be made of the dwarf forms, planting the taller growers a few feet apart and allowing the character of the smaller species to be seen between the stems of the Bamboos or Arundos.

Pampas Grass

This fine plant is so well known that it requires no description, for at least one or two plants are to be found in every garden of any pretension, and yet it is worthy of better treatment than it often receives. It should be given a deep good soil well-enriched with manure, a sheltered situation and plenty of water during the Summer months; under these conditions the reward will be a great mass of graceful foliage and a splendid group of noble plumes in the early Fall.

Propagate by dividing the roots in February or March.

Several garden varieties have been raised, some with pink plumes, which are very effective.

Arundo

Tall perennial bamboo-like grasses growing, in good soil and suitable situation, to the height of twenty-five feet, the stems being upright in habit with broad leaves which droop handsomely. All of the species are highly ornamental either when planted as single specimens on the lawn or when grouped in masses with bamboos or with other ornamental grasses.

The Arundo delights in a light rich soil, a sheltered situation and plenty of water at the roots during the growing season. Arundo Donax and its variegated variety and Arundo conspicua will be found the most useful of the genus.

Propagation is effected by division of the roots in early Spring.

Eulalia Japonica

This is one of the most handsome of the grass family and grows to the height of from four to six feet, topped with a feathery plume which is very ornamental.

It forms an excellent border plant and is also well-suited for grouping with other grasses such as the Pampas Grass or the tall Arundo Donax.

It is easily increased by division of the roots in Spring.

There are several varieties of the Eulalia, some of them with striped cream-colored bands running through the middle of the leaves, and others with bars of yellow running crosswise.

Pampas Grass.

CHAPTER XIII

SUCCULENTS

THE Succulents include many very handsome and interesting plants, extremely varied in their character, most of them having thick fleshy leaves or stems. Many are useful for planting in dry sandy or rocky banks' and for covering, with gay colors and interesting foliage,poor spots of dry soil which are out of reach of water or too barren to sustain any other class of plant. Among the large number which are perfectly hardy and very ornamental are many of the Cactus, Agave and the large family of Mesembryanthemum and Portulaca, also the gorgeous free-flowering Crassula, etc.

Collections of Succulents should be planted in the dryest and best-sheltered portions of the garden. They should be watered very sparingly during only very dry weather, and even then only when the plants show signs of flagging or wilting. The soil best suited for most of them is a dry, rocky, well-drained, loose, light loam such as is used in rockeries, for growing in which most of the Succulents are admirably adapted.

AGAVE (*Century-Plant*)

This common inhabitant of our gardens is one of the most stately and characteristic of our California garden landscape plants, its massive fleshy foliage, when full-grown, making a fine effect in the sub-tropical gardens, and being excellent for large vase-work in front of buildings or the decoration of terrace walks, etc. It is a very slow grower, not attaining its full growth until fifteen or twenty years old, when (and not until then) it sends up its tall column-like flower-scape to the

height of from thirty-five to forty feet, or more, with a diameter of stem of over six inches at the base. The flower-scape makes a growth of six inches every twenty-four hours, drawing its sustenance seemingly from the thick large fleshy leaves. As the flower-stalk grows in height, the leaves gradually become thin and flabby until the flower-scape attains its full height, when the leaves are completely drained of all sap and flesh and become shriveled, lifeless pieces of fibre. After perfecting the flower, and ripening its seeds, the whole plant dies to the ground and is succeeded by a colony of suckers, which form about the roots of the old plant. These should be taken up late in the Fall and planted in nursery rows about a foot or eighteen inches apart, and should be grown on until large enough to be planted out in permanent quarters. There is quite a large number of interesting species belonging to this genus, some of them with variegated leaves and others with rosette-like bunches of leaves and of dwarf habit.

Aloe

These interesting plants are mostly natives of the Cape of Good Hope, some of them becoming arborescent and branched, and growing to the height of sixty feet. They delight in a loose rocky soil and a warm sunny situation, and require little artificial irrigation.

Aloe vera.

They are mostly of very slow growth although Aloe ciliaris makes several feet of growth in a season. Most of them bear red or yellow flowers in stiff spikes, which, combined with their rugged grotesque habit, make them excellent for planting in dry rockeries, etc.

Propagate in early Spring by seeds, suckers or cuttings; cover the seeds to a depth of one-quarter of an inch.

Cactus

This most interesting genus contains many hardy species, and collections should be seen in our gardens more commonly than they are. Most of them are of easy culture, provided they are not excessively watered or planted in a too adhesive soil. They all prefer a warm dry sunny situation and a light sandy soil well drained; the soil should also contain a small percentage of lime; mixing a quantity of lime-rubbish with the soil not only gives the soil the necessary amount of lime but also serves as a drainage medium.

The Cereus type contains many of the most gorgeously-colored and largest-sized flowers of the genus.

The Echinocactus, with its prickly oval or round-shaped ribbed grotesque form makes excellent specimens for the rockery or desert garden.

The Mamillarias with their beautiful forms, their rosy, yellow or white flowers and their delicate designs are indispensable in all collections.

The Opuntia, or Indian Fig, or Prickly Pear, is the most common and also the easiest to grow of all the Cactus family. It is well known throughout the State both as an ornamental and a hedge plant for which purpose it is exceedingly useful, as no animal, however hardy, will attempt to break through it on account of the strong sharp spines which the plant sends out in all directions.

The Phyllocactus is known by its flat leaves, its long calyx tubes and large gorgeously-colored or white flowers.

Several of the genus are natives of California, among which may be mentioned Mamillaria Goodrichii, Mamillaria Grahami, Echinocactus viridescens, Echinocactus polycephalus, Cereus Emoryi, Cereus giganteus,

Opuntia littoralis, Opuntia Ficus-indica, Opuntia prolifera, etc.

The Cactus is propagated most commonly by cuttings late in Spring. The cuttings should be removed with a sharp knife, and laid in a dry place until bleeding stops and the wounds are dried. They should then be inserted in sand until they emit roots when they may be planted in their permanent places.

Cotyledon (*Echeveria*)

A genus of succulent herbs or shrubs, comprising about sixty species most of them natives of California, Mexico and Southern Africa. They are useful in formal bedding, and for rockwork where little or no artificial irrigation is given. A very interesting and effective rockwork is that planted with the different kinds of Cotyledons, Sempervivums, Mesembryanthemums, Sedums, Crassulas, etc., and, as these all grow and bloom profusely without artificial watering, many waste spots, which otherwise might be left to weeds and litter, can thus be made attractive.

Echeveria.

The Cotyledons are very easily propagated by cuttings made from the stems in September. Strip them of leaves for about two inches, and, after cutting the ends with a sharp knife, insert them in sandy soil in a sunny situation, giving them very little water until they have formed roots which will be in two or three weeks. They may also be propagated by leaf cuttings, by simply parting the individual full-grown leaves from the stem, care being taken when parting them that the dormant bud at the axil of each leaf accompanies it. Insert them in sandy soil, about one-quarter of an inch deep, and give them

a little water for two weeks or until they have formed roots. If the cuttings are put in in September or early in October, they will be ready for setting out the following Spring.

Crassula

This beautiful succulent from Table Mountain is one of the best plants for planting on rocky hillsides or ledges as it grows freely without care or watering if given a handful of soil in which to start. Plant the young plants early in February and give them a little water to settle the soil about the roots; they afterwards will take care of themselves.

Crassula coccinea.

When planted on a sunny slope (preferably facing the East) in loose, well-drained soil, with a background of low-growing, dark foliage, such as dwarf Pine, Cypress or Juniper, it is very effective as it also is in the rockery among other succulents, such as the large-leaved Echeverias and Sedums or the smaller Mesembryanthemums.

There are many species of this interesting genus, including Crassula arborescens which grows to the height of three feet and has rose-colored flowers, and Crassula coccinea, the best known of the species, bearing scarlet flowers of a most dazzling hue which entirely cover the plant. Others bearing white flowers are also very pretty.

Propagate by cuttings, placed in sandy loam in a cold frame, in September; give them just enough water to keep the leaves from wilting.

Mesembryanthemum

A genus of over three hundred species, mostly succulent perennials or annuals which make excellent plants for covering dry banks or borders, and, where water is scarce, and where they are not likely to be trampled over, a good substitute for grass, many species being of a creeping spreading habit, hugging the ground closely and forming a carpet of rich green. Mesembryanthemum spectabile and Mesembryanthemum versicolor are chiefly grown for the blaze of color they give during sunshine. Mesembryanthemum æquilaterale, Mesembryanthemum australe, etc., are mostly used for covering rocky banks, sand flats, and slopes, etc.

Mesembryanthemum spectabile.

The Mesembryanthemum is not used so freely as it ought to be. Many waste pieces of ground, dry shifting steep slopes, railroad embankments, etc., now of a neglected, unkempt appearance, could be planted with any of the stronger-growing, thick-leaved species of this genus, which, in addition to making a covering for the ground, would hold the slopes or embankments from sliding or from being moved by the elements. Mesembryanthemum australe (white-flowered) is the best for this purpose as it is a hardy, strong grower and a deep rooter, forming a dense, thick carpet of heavy stems difficult to move or wash out of position.

Propagate by inserting cuttings, in Spring, about six inches apart, where they are to bloom, or where wanted, first preparing the ground by cultivating (either by plowing or spading) and raking it over to make it smooth on the surface,

breaking any lumps which may be left, so that, in planting, the dibble may be worked easily and quickly.

Sedum

Sedum is a genus of over one hundred species most of them with fleshy leaves and yellow, white or pink flowers, although one or two, such as Sedum Sempervivum, have scarlet flowers. Sedums are of very easy culture, preferring a light sandy soil and a sunny situation and being exceedingly useful for covering dry banks and rocky ridges away from the hose or in the thinnest soils. They are also effective for window-boxes or for carpet-bedding.

Sedum.

Propagate by cuttings placed in sandy soil in a sunny sheltered situation in Spring, or by seeds sown in February. Cover the seeds to the depth of one-eighth of an inch. When the seedlings are an inch or two high, prick them off, two inches apart, in pots or boxes, planting them in their permanent places in May.

Sempervivum (*Houseleek*)

A genus comprising fifty or sixty species, natives of Madeira, Asia Minor, Abyssinia and the Western Himalayas, bearing white, pink, yellow or purplish flowers and thick fleshy leaves, useful in carpet-bedding and for small rockwork.

Propagate by offsets taken from the parent plant in early Spring and planted in any sunny situation, in light sandy soil, about two inches apart.

CHAPTER XIV

HERBACEOUS AND BEDDING PLANTS

Acanthus

THE Acanthus is a group of stately ornamental plants of vigorous growth and handsome foliage. To grow well, they require rich, deep soil well-fertilized with old manure, and plenty of water during the Summer months. They show their character best when grown in single tufts, at the bend of a walk, on a bed of turf and in a sheltered, half-shaded situation. Acanthus mollis latifolius, Acanthus niger, Acanthus spinosus and several other species are all very desirable for giving tropical effects in Summer or Winter.

Propagate by dividing the roots or by seeds sown in Spring, under glass in gentle heat, covering the seeds to the depth of an eighth of an inch. Pot the young seedlings singly when they are an inch or two high, and plant them out of doors when they are three or four inches high.

Acroclinium

A small genus of hardy annuals, bearing everlasing flowers of many shades of rose and white. They are very easily grown in any garden soil.

Sow the seeds out of doors in April, in patches where they are to bloom, covering the seeds to the depth of about one-eighth of an inch; when the young seedlings are two or three inches high, thin them to six inches apart and mulch the surface with one-half inch of old well-decomposed manure, giving water when necessary.

Ageratum

This well-known Summer-flowering plant is a general favorite on account of its pretty blue flowers and long-continued season of profuse blooming. A good light loam well-enriched with old manure will grow it well. Plant the dwarf varieties six inches apart, and the tall species about fifteen inches apart.

Propagate by cuttings in September, in a cold frame or greenhouse; in Winter protect them from frosts; plant them out of doors as soon as the danger from cold weather is over.

Ageratum.

Agrostemma

Hardy evergreen perennials and annuals with lance-shaped leaves and star-shaped flowers. They are of easy culture, growing freely in any soil and (being mostly natives of Southern Europe) requiring little water. They are also well adapted for ornamenting dry banks if planted after the first rains in Autumn. Seeds of the annual species should be sown in August in a cold frame or in a sheltered border; barely cover the seeds with finely sifted sandy soil; plant them out in October and they will begin flowering in April. The perennial species, such as Agrostemma coronaria, are increased by division of the roots, the early Winter being the best season for their division.

Althæa rosea (*Hollyhock*)

The Hollyhock is one of our old favorite garden plants, indispensable for producing bold striking color effects in our

flower-borders and shrubberies. It delights in a rich light soil and an open sunny situation.

Seeds should be sown as soon as ripe, in September or early in October, either in an open sheltered spot out of doors or in a cold frame, being covered to the depth of a quarter of an inch. As soon as the seedlings are large enough to be handled, prick them out about three inches apart in boxes, or singly in three-inch pots, in light rich soil composed of one-quarter very old manure, one-half good surface loam and one-quarter leaf-mold with enough sand to keep the soil open, all well-mixed together by having been turned over several times. Plant they out, where they are to bloom, in February or early in March, in specially prepared, well-cultivated soil enriched with well-decayed manure, the ground having been dug two feet deep and the manure mixed freely with the soil. When the flower-spikes appear, mulch the ground about the roots with a heavy dressing of half-rotten manure and support the flower-stalk by a good stiff stake eight feet long by two inches square tapering to one inch square at the top, the stake being sharpened and driven two feet into the ground. The roots should be given a fair supply of water but overwatering must be guarded against, as too much water seems to encourage the Hollyhock fungus, a disease which has ruined many fine plants. Should this disease make its appearance, pick off the affected leaves at once and burn them up to prevent it spreading.

The Hollyhock, in addition to being propagated by seeds, may be increased by cuttings of the young shoots which grow up from the old root. These should be taken off when about three or four inches long, and placed in a shady sheltered spot in soil composed of sand and leaf-mold, until rooted, when they may be treated as recommended for seedlings.

Alyssum

A genus of hardy annuals or shrubby perennials, very free-flowering and excellent for planting on dry banks and among hardy shrubs, for covering the ground, or for rock work. Alyssum alpestre, or Sweet Alyssum, is raised by simply sowing the seeds, in Winter or early Spring, where wanted, covering them lightly with light soil; thin the plants to about six inches apart. Alyssum saxatile, and other shrubby species, are best propagated by cuttings placed in a cold frame in September and shaded for about two weeks or until rooted, when they should be gradually exposed to light and air and placed out of doors until wanted.

Amarantus

Hardy annuals with alternate entire leaves and small red or green flowers in clustered spikes. They are mostly grown for their handsome reddish-colored leaves and graceful habit of growth. They require rich soil, a sheltered situation and a generous supply of water to develop their full beauty. Amarantus bicolor, Amarantus salicifolius and Amarantus tricolor will be found among the best species for general planting.

Propagate by seeds sown in February, in slight bottom heat, in a glass frame. Cover the seeds to the depth of an eighth of an inch.

Anemone

An extensive genus of hardy ornamental perennials with ranunculus-like flowers and variously-shaped leaves, some species (such as Anemone japonica) growing to a height of three or four feet, and others (such as Anemone Hepatica) growing only a few inches high. Some are suitable for borders, while others (such as Anemone coronaria) are best grown in beds of rich light soil, in a sheltered, partially-shaded situation. The tuberous-rooted species should be

planted in October or early in November, about six inches apart and three inches deep, and if, in addition, there is planted a carpet of Pansies, or, better still, of the blue-flowering Arabis, a most charming effect will be produced. After flowering and as soon as the leaves turn yellow, the tubers should be taken up and spread thinly in a shady airy place until they are dry, when the leaves should be taken off the tubers, and the tubers stored, in a cool dry place in boxes of dry soil until the planting season.

Anemone fulgens is a perennial species and prefers a moist situation and partial shade, but does well under any ordinary garden treatment. Anemone japonica makes an admirable border plant, easily grown and propagated by division of the root. For cutting purposes this species and its white variety are invaluable.

Antirrhinum (*Snapdragon*)

This popular genus contains many species, but Antirrhinum majus is the most popular and useful, its long racemes of many-colored flowers being excellent for filling beds, for decorating the herbaceous borders, or for planting among low-growing shrubs. Their cultivation is easy, as they grow well in any garden soil.

They are easily propagated either by seeds or cuttings, but the simplest way is by sowing a packet of seeds in early March under glass, covering the seeds to the depth of one-eighth of an inch; prick out the young seedlings, as soon as they are fit to be handled, three inches apart in boxes, placing the boxes in a cold frame and shading for a few days. After they are hardened off, they are ready to be planted in their permanent quarters.

The seeds may be sown out of doors, in a sheltered spot, in early Fall, and thinned to six inches apart, or transplanted to where they are to remain, and, if a succession of bloom is desired, another lot may be sown in April and treated as recommended for those sown in Fall.

Aquilegia (*Columbine*)

Erect, hardy perennial herbs, flowering in panicles. The Columbines love a semi-shaded situation, well-sheltered from harsh winds and strong sunshine, preferably under the shelter of low-growing deciduous shrubs. They also do well in the open ground, but under these conditions their flowers lack the delicate tinting of those grown in the light shade; any soil not too heavy, if well drained, will suit them.

Seeds are produced in abundance, and should be sown, covered to the depth of one-eighth of an inch, in the Fall (or as soon as practicable after they are ripe) in a shady place convenient to water; as soon as they are strong enough to be removed, they should be planted where they are to flower.

There are many handsome species including our native species, Aquilegia chrysantha (yellow tinged with red), Aquilegia cœrulea from the Rocky Mountains (sky blue) and Aquilegia glandulosa, etc., all of them well deserving a place in our gardens.

Aster

The Chinese Annual Asters are too well known to require description, their diversity of color and compact habit of growth rendering them almost universal favorites. They delight in a cool moist loamy soil, enriched with well-decomposed horse- or cow-manure.

The seeds should be sown, early in March, either out of doors or under glass, in pans, pots or boxes in light sandy soil, and covered very lightly with sandy leaf-mold; water lightly and keep the soil moderately moist until they germinate; as soon as they make an inch of growth prick them out, about three inches apart, in light rich soil and grow them on until they are about four inches high; harden them off in a sheltered place out of doors, and plant them about one foot apart

where they are to flower; about two weeks after they have been planted, mulch the entire surface of the soil, between the plants, with about one-half inch of rotten manure and give a good watering. To produce fine flowers, the Aster should never suffer from lack of water and should receive a good drenching at least once a week; should extra large flowers be desired, the flowers should be thinned to about five or six to a plant, and the plant supported by a neat stake.

Aubrietia deltoidea

Where a dense cushion effect of deep blue is desired in early Spring, procure a packet of Aubrietia seeds and sow in the open where they are to flower, covering the seeds very lightly; September is the best time to sow. As soon as the seedlings are well up, thin them to three inches apart and encourage them by watering, never allowing the soil to become very dry. They may also be sown in September in a cold frame, and transplanted in November or December to where they are to bloom. Where there is a stock of old plants they may be propagated by cuttings any time after flowering. There are several varieties, all of them very useful for carpet effects in early Spring.

Begonia

A large genus of succulent herbs with tuberous or fibrous roots and showy flowers or leaves. Most of the richly-colored flowers and handsomely-marked leaves are the result of hybridizing by specialists, who have, by cross-fertilizing and high cultivation succeeded in raising the Begonia to the high estimation in which it is now held for indoor and outdoor decoration. The hardier varieties of the tuberous section, and also the Vernon types, make excellent plants for bedding, and the tall stately Begonia rubra, if given a sheltered position, forms grand specimens, especially in our coast counties.

The tuberous Begonia should be much more generally seen in our gardens than it is, as it is very hardy, is easily grown and remains longer in bloom than most of our Summer-flowering plants, commencing to flower early in June and giving a profusion of gorgeously-colored blossoms until late in November.

Begonia Vernon.

The Begonia delights in an eastern exposure, a sheltered, partially shaded situation, a light rich loamy soil and plenty of moisture at the root during the growing season. Anyone giving the tuberous Begonia these simple conditions will be generously rewarded for the little trouble and expense devoted to this beautiful exotic.

As soon as flowering is over, the tuberous-rooted species should be taken up, the tubers cleaned and dried in a cool, airy shed, and afterwards packed in dry soil and laid away in a cool place until March, when they should be potted singly, in pots a little larger than the tubers, in soil composed of one-third loam, one-third leaf-mold, and one-third sand with a sprinkling of old manure mixed through the compost. Place the pots in a cool frame, and, when the young plants make from four to six inches of growth, plant them out where they are to flower. The Vernon type is propagated by seeds sown and covered very lightly with finely sifted sandy leaf-mold, in February, the young plants being pricked out three inches apart in pots or boxes as soon as they are large enough to be handled, and planted out, about the first of May,where wanted to bloom. They may also be easily increased by dividing the roots of the previous year's growth just before growth commences in the Spring.

Bellis (*Daisy*)

The Bellis perennis or common Daisy is a well-known hardy free-flowering border plant, growing well in any garden soil and easily increased by simply dividing the roots immediately after flowering, each crown making a separate plant. It may also be raised from seeds, but as a large percentage of seeds obtained are single-flowered, it is much safer and more satisfactory to propagate by dividing the roots. In propagating from seeds, the seeds should be covered to the depth of an eighth of an inch.

Bocconia

A genus of tall, stately, herbaceous, ornamental-leaved plants with terminal panicles of inconspicuous flowers; an excellent plant for giving subtropical effects in conjunction with other large-leaved plants, or as single specimens on the lawn. To grow their handsome cordate leaves to their full size requires a deep, rich soil and abundance of water. Bocconia cordata (from Japan), Bocconia frutescens (from Mexico) and Bocconia integrifolia (a native of Peru) will be found the best species for growing in this latitude.

Propagate by taking up, in early Spring, the young suckers which form about the roots, and planting them in nursery rows until the following season. They are also easily propagated by seeds sown in Spring in a sheltered spot in the open border; cover the seeds to the depth of one-quarter of an inch.

Calandrinia

A genus of fleshy smooth-stemmed annuals or perennials mostly natives of Australia, Chile and California. Their cultivation is very simple and they grow freely in any soil or exposure not too much shaded, while they are excellent for covering waste places with color until early Summer.

Sow the seeds, one-eighth of an inch deep, where they are

to remain, as soon as the Fall rains have moistened the soil; should the seeds germinate very thickly, thin out to six inches apart. Unless birds or insects pick up the seeds they will re-seed the ground and come up again the following season.

Calendula

Hardy annuals which may be had in bloom every month of the year by making three sowings, one in January, the next in May and the third in August or early in September. A spot in the open ground will suit them, and, when the young plants are a few inches high, they should be planted where they are to flower, or the seeds may be sown, about one-eighth of an inch deep, where they are to bloom, and thinned to one foot apart. At the time of thinning, give the surface of the ground a mulch of half an inch of well-rotted manure; this will encourage their growth and produce larger and finer flowers.

Campanula

The Campanulas are among our most showy perennial or biennial plants; all of them are elegant when in bloom and should be seen more commonly than they are. The stately Campanula pyramidalis, which often grows from eight to ten feet high, forms grand pyramids of blue or white; Campanula Medium (Canterbury bells) is among the best of our border plants, and the dwarf-spreading Campanula carpatica and its varieties are also very desirable border plants. They delight in a deep rich loam well drained; a mulching

Campanulacarpatica.

of old manure helps to keep the soil cool during the Summer months and to conserve the moisture. The tall-growing kinds should have their flower-stalks supported by neat stakes painted green so as to show as little as possible.

All of the species are easily raised from seeds sown a quarter of an inch deep in early Spring, out of doors or in a frame, and again in the Fall, giving a succession of bloom throughout the year.

Canna (*Indian Shot*)

A large genus of hardy herbaceous perennials, extensively employed in beds and flower-borders, their handsome banana-like leaves and many-colored flowers in stately spikes giving fine tropical effects in Summer gardening. Few plants are more easily grown, but to do well, they require a rich deep soil and plenty of water at the root. Before planting, the soil should be trenched two spades deep and freely mixed with half-rotted horse-manure. The plants should be set out about two feet apart; if in beds, the taller varieties should be planted in the middle and the dwarf kinds on the outside. A partially-sheltered sunny spot should be selected, as harsh winds rip the foliage and damage the flowers.

Canna indica.

Propagation is easily effected by dividing the roots; each rootstock with bud and roots attached will make an independent plant. Divide the roots and plant new beds as soon as growth commences in Spring, generally late in March or early in April. They may also be propagated from seeds sown in the early Spring and covered to the depth of half an inch.

Celosia

A genus of crested or pyramidal flowering plants much used in bedding or for planting in groups or singly in flower borders. The crested forms are dwarf, and form cockscomb-like heads, sometimes nine inches long, and, in fine specimens, as much as four inches broad. Those of bushy or pyramidal form are graceful and open in habit, and grow, in fine specimens, from four to six feet high. The Celosias delight in a warm sunny situation and a deep rich soil not too heavy.

They are propagated by seeds sown in March, in a gentle heat, and covered to the depth of an eighth of an inch. When they are two inches high, pot them singly in three-inch pots and return them to a house or hotbed until they form fresh roots in the new soil, when they should be moved to a cold frame and gradually hardened off by being given a free circulation of air. Plant them, about the beginning of May where they are to bloom.

Centaurea (*Corn-flower*)

This well-known genus is easily grown in any garden soil by simply sowing the seeds, one-eighth of an inch deep, in the open ground, in March, where wanted to bloom, and thinning the plants to six inches apart; after thinning, mulch the ground about the plants with half an inch of old manure and give a good watering.

Centaurea ragusina, the woolly-leaved species, is better treated by sowing the seeds in a gentle heat, in February, and, when large enough to be handled, pricking them off three inches apart in boxes. Harden them off gradually and plant them in the open ground early in May. This species also may be propagated by cuttings in September or October.

CHEIRANTHUS (*Wallflower*)

Biennial or perennial herbs. These much admired Spring flowers will thrive almost anywhere and with little attention, by simply sowing the seeds, one-eighth of an inch deep, where they are to bloom, in October or November, and thinning the plants when two or three inches high, to six inches apart, but, where fine spikes of either single or double varieties are desired, the seeds should be sown in August in a cold frame, and, when large enough to be handled, the seedlings should be planted, three inches apart, in boxes filled with light soil, and transplanted to their blooming quarters early in November. This treatment will bring them into flower early in April.

CHRYSANTHEMUM

This hardy and important Fall-blooming plant is a favorite with all plant lovers, and, to grow to perfection, requires considerable care and skill, but good results may easily be had by ordinary garden treatment if the soil is deep and well-enriched by a generous allowance of rotted manure.

It is propagated by cuttings, by suckers or by dividing the roots in March or April. Cuttings should be inserted in a gentle heat, or in a cold frame kept close and shaded for a few days; as soon as they are rooted, they should be potted in three-inch pots and returned to the frame, being shaded until they make fresh roots, when they should be given plenty of air and kept close to the glass, care being taken that they never once suffer from want of water. Plant them where they are to bloom, early in May or as soon as they have made six inches of growth.

The young shoots should have their points pinched off to encourage the stems to branch; this operation should be repeated once a month until August 1st. Plant them about two feet apart; after planting, mulch the entire surface of the beds or borders with half-rotted horse-manure and give the

ground a thorough soaking with water. Chrysanthemums require enormous quantities of water, care being taken, however, not to sour the soil by giving too much. In hot dry districts of the State they should be planted, if possible, on a northern exposure or partially shaded during the Summer months.

The Chrysanthemum is divided into many sections including the incurved (whose strap-shaped florets curve inward), the recurved (whose florets curve outward from the center), the anemone (or grilled form), the pompon (or small-flowered) and the fringed Japanese or ragged section. The pompon and the recurved are considered the most satisfactory for outdoor bedding as they are more free-flowering and not so easily damaged by Fall winds or wet weather. When the young plants are about twelve inches high, a neat stake should be placed at each stem, and the stems tied to the stakes, as they need the support.

Cineraria

The Cineraria is one of our gayest early-Spring flowers, and, as it is so easily grown, should be more commonly seen than it is. It thrives in any soil, flowering most freely in any district which is free from frost, and, if planted under the shade of trees where there is a little protection, it grows freely and blooms constantly from January to July.

Cineraria hybrida.

The Cineraria prefers a light sandy soil well enriched with old manure. Propagation is effected by seeds, sown in June, in a cold frame or in a shaded spot out of doors. As the seeds are very small, the surface soil, on which the seeds are to

be sown, should be sifted leaf-mold, smoothed over and pressed firm. Sow the seeds thinly and regularly over the surface and cover them lightly with finely sifted soil composed of leaf-mold and sand well-mixed together, afterwards watering with a fine-rosed watering-pot. The seeds should be shaded until they germinate, and, when the seedlings are large enough to be handled, they should be transplanted to three inches apart, and placed where they are to bloom, early in October. An ideal spot for flowering the Cinerarias is under an evergreen tree whose lower branches spread over the surface about four feet above the ground.

Coreopsis

This showy annual or perennial herbaceous plant is one of our favorite border ornaments, flowering after most of our Summer annuals are past blooming and thriving in any good garden loam.

Propagate by sowing the seeds, one-eighth of an inch deep, either in a frame or in a sheltered place out of doors or where they are to bloom. They germinate freely and should be planted or thinned to one foot apart; mulch the ground with well-rotted manure and give them plenty of water at the root. The perennials are propagated by dividing the roots in early Spring, planting them two feet apart and treating them as recommended for the annuals.

Cosmos

This well-known hardy annual is another of our Fall-blooming favorites, being much used for cut flowers in decorating rooms as it lasts well in water. It thrives in any good garden soil, well enriched with manure.

Propagate by seeds sown in March in a cold frame; cover the seeds very lightly with finely sifted sandy leaf-mold. Transplant them, when two inches high, into boxes, placing them four inches apart; plant them in the open early in May, two feet apart; mulch the ground well with old manure and water freely during the Summer months.

Dahlia

The Dahlia is a popular genus of only a few species, all natives of Mexico. Dahlia variabilis is probably the species from which most of the show Dahlias have originated, while Dahlia Juarezii is the original of the Cactus section, the varieties of which have become so popular. As Dahlia imperialis is such a late bloomer, no varieties of this, of any great merit, have as yet been introduced.

Dahlia imperialis.

Dahlias are among the best of our Summer and Autumn-flowering plants, and are now considered indispensable in garden decoration, whether the garden is large or small. With care and attention they may be had in flower from May until late in November. The first planting should be done early in March, and a second planting (which should be of Spring-struck cuttings) ought to be made about June 1st. The first planted will bloom from May until late in the Fall, and the second will begin flowering in August, continuing in flower, if the old flowers are picked off and the small weak shoots thinned out, until November.

To grow the Dahlia well requires good soil not too stiff, well-enriched with half-rotted horse- or cow-manure. The ground on which the Dahlia is to be grown should be trenched two spades deep, the manure being freely mixed with the soil. Before planting, the ground should be staked off, and the varieties grouped according to their color and height, their respective positions being fixed, so that, when they come in bloom, the whole will be a pleasing blending of color and form. Before planting also, the soil, immediately about where the young plants are to be set, should be freely

stirred to the depth of a foot; after planting, give the soil a good soaking of water and tie the young stems to temporary stakes. As the Dahlia is a gross feeder, water must be supplied in abundance about three times a week, and, after flowering commences, manure-water should be given once every week; this will give greater depth of color and substance to the flowers and more vigor to the plants, enabling them to make fresh growth and a longer continuance of bloom.

Propagation is effected by seeds, cuttings or division of the roots; by seeds sown and covered to the depth of a quarter of an inch, in February; by cuttings, in March, taken from the young shoots which start from the neck of the tubers; by division in early Spring before growth commences. Young plants raised from cuttings generally give better results. To get good cuttings, the tubers should be placed in a frame with a gentle bottom heat. Place the tubers about a foot apart over the bed of the frame and shake about one inch of soil, composed of half leaf-mold and half sand, over the tubers, care being taken that the necks of the tubers are not covered; give a light sprinkling of water and keep the sash of the frame closed so as to have a warm moist atmosphere at all times, while a light sprinkling of water should be given once a day. This will be sufficient to induce the production of shoots, and each of these may be removed as soon as it has two joints. Place the cuttings (in a warm frame or hothouse) in beds, boxes or pots in leaf-soil and sand, where, in about a week or ten days, roots will be formed; as soon as rooted they should be potted singly in three-inch pots and placed in the same temperature where they should remain for two weeks or until they take with the new soil; they should then be removed to a cold frame, and gradually exposed to the open air. They should be given more pot-room as required, or planted out where they are to flower. After the plants are finished blooming in the Fall, the tubers should be taken up and placed in a cool airy shed until they are wanted in Spring. Where there are no facilities for propagating by cuttings, the tubers may

be left in the ground until about March first, when they should be taken up and separated singly, allowing one shoot to each tuber, and planted where they are to flower.

Delphinium (*Larkspur*)

A race of hardy ornamental perennials, biennials or annuals with tall branching flower-stems and beautiful palmated leaves. They are very easily grown, but, if fine flowers are wanted, they must be given special attention, while the soil should be deep and enriched with old manure well incorporated with the soil. They should be planted about three feet apart, and, as soon as the shoots attain a height of one foot, a stake must be placed at each shoot for its support, as they are easily broken by the winds. After flowering, the stalks should be cut down, when the young growth will sprout from the base to form flowering shoots for the following year.

Propagate by division of the roots, or by seeds which may be sown at any time, when the ground is in order, from October to February, the seeds being covered to the depth of a quarter of an inch. Division of the roots is much the simplest plan for increasing them, and early Spring the best season for dividing the roots. The annual species (such as the common Larkspur) are propagated only by seeds sown in the open where wanted to bloom; when the seedlings are three or four inches high, thin them to one foot apart and mulch with old manure.

Dianthus Caryophyllus (*Carnation*)

There are no hardy flowers more deserving general cultivation than Carnations, as they present charming diversity of coloring with delicious, spicy perfume. They thrive best in a fresh loamy soil not too heavy, a yellow or brown loam being best suited for growing them.

Propagation is effected by seeds, by cuttings or by layers;

by seeds, in early Spring, sown in pots or pans in light rich soil composed of half sand and half leaf-mold, the seeds being covered lightly with the soil. Place in a mild bottom heat, and, when the seedlings are about one inch in height, prick them off about two inches apart in boxes; then return them to the same temperature (a mild hotbed) and shade them during hot sunshine for a few days or until the young seedlings have taken root in the new soil; afterwards remove them to a cold frame and gradually expose them to the open air. Plant them, about the middle of April, where they are to flower, in a sunny situation protected from cold winds, in soil which is fresh, not having been used for at least a year before in growing flowers of any sort.

In propagating by cuttings, use only wood which is short-jointed and carries strong healthy leaves. Dibble them about one inch apart in boxes filled with sandy leaf-mold, and place them, in March, in cold frames or in a shaded, sheltered spot out of doors. They may also be put in (in a similar situation) in September with equally good results. As soon as they are rooted, transplant them three inches apart either into boxes or into a sheltered border until ready for their permanent quarters.

Where only a few growths of any desirable variety can be had, propagation by layering is perhaps the surest of all methods. Layering is effected by simply bending one of the branches or shoots into the soil (after, with a sharp knife, having cut a slit into the shoot on the underside, about half through the stem) and, with a hooked peg, pegging it into the ground about one-half inch below the surface. Then, to a light stake, tie the point of the shoot in an upright position, which will open the cut or slit, care being taken not to sever entirely the point of the shoot from the main stem. Next cover the cut part with light sandy soil and give a good watering. Keep the soil moderately moist, and in a few weeks the layers will be rooted when they may be severed from the parent stem and planted where they are to bloom.

Should the Carnation be attacked by rust or spot, pick off all the affected leaves at once and spray the entire plant with Bordeaux Mixture composed of one pound of powdered copper-sulphate in two gallons of water and one pound of fresh slaked lime in two gallons of water, these being mixed together and enough water being added to make ten gallons. Mix and stir the whole thoroughly and apply with a sponge or syringe, seeing that the underside of all the leaves is reached by the spray. About May first give the soil around the plants a good mulching with very old well-decomposed cow-manure and give water as required. As soon as the flower-stalks are six inches high, stake each flower-stem with a light stake about one-quarter of an inch in thickness, tying the stem loosely to the stake, to keep the flowers from being blown about by the winds or from being bent to the ground by watering. Pick off all spent flowers as soon as they lose color, and give water as required.

Dianthus

A genus of many species including the Chinese Pink (Dianthus chinensis), Sweet William (Dianthus barbatus), etc., of easy culture and thriving in any good soil. The Sweet William is generally propagated by sowing the seeds, one-eighth of an inch deep, in July. When the seedlings are one inch in height, prick them off, three inches apart, in boxes, and plant them, in October or November, where they are wanted to bloom. The Chinese Pink should be sown in a warm frame or greenhouse in February, pricked off three inches apart, in boxes, when one inch high, and planted out of doors in April or early in May.

Digitalis (*Foxglove*)

A genus of about twenty species of hardy perennial or biennial flowering plants of stately habit, bearing racemes of funnel-shaped flowers. They thrive in any soil or situation but prefer a shaded spot under the limbs of trees or among tall-growing shrubs where they give a fine effect in early Summer.

Propagate by seeds sown out of doors, in June, and covered very lightly. After the first rains in the Autumn, plant out the seedlings about a foot apart.

Digitalis.

Doronicum.

Doronicum

This old favorite herbaceous plant should be more commonly seen in our gardens than it is. Its Marguerite-like yellow flowers, growing on tall stately stems, make it an excellent cut flower for filling vases and decorating rooms in early Spring. It is of easy culture in any garden soil.

Propagate by division of the roots during December or January.

Eschscholtzia (*California Poppy*)

This beautiful native wildflower, the glory of our fields and hillsides, requires no description. Any garden soil suits it, the

Fuchsia.

stronger the soil the deeper the color of the blossoms; in heavy loam they are deep orange in color, while in sand they are of a pale lemon shade with smaller flowers and shorter leaves.

Propagate, after the first Fall rains, by sowing seeds in places where they are to flower, and covering the seeds to the depth of an eighth of an inch. The young plants, when two inches high, should be thinned to six inches apart; give the ground about them a light mulching of old manure. In ordinary seasons they require no artificial irrigation. There are several garden varieties with different shades of color from white to a reddish orange, including some which are pink.

Fuchsia

A genus comprising about fifty species of small shrubs or trees, most of them having been introduced from South America and Mexico. Fuchsias are among the most popular and ornamental of our garden plants, especially along the coast where they receive the benefit of the cool ocean breeze and attain a height of twenty feet. Whether the garden be large or small, it should have a few representative Fuchsia plants. They are excellent for covering fences or walls, where their branches with their panicles of rich flowers should be allowed to grow and droop naturally. For forming bush or pyramid-shaped specimens, Fuchsias are admirably adapted; if for pyramid, they should be trained with a single stem, the branches being pinched when they grow out of shape and the main stem being allowed to take the lead, it being pinched only when it fails to branch. When a bush-shape is wanted,

Fuchsia.

pinch the main shoot and allow the branches to grow freely, pinching those only which are inclined to grow ahead of the others and thus threaten to get the plant out of shape. Before growth commences in Spring, the plants should be pruned back to the shape desired, and at least half of the previous year's growth cut off.

Propagate in September by cuttings placed in a cold frame and kept close and shaded for about two weeks when a little more air may be admitted, or they may be struck (in the open air) in a shaded place away from draughts of air, and kept moist. Soil for the cuttings should be composed of half sand and half leaf-mold; as soon as the cuttings are well rooted, they should be potted singly in three-inch pots and replaced in the frame until they form fresh roots. Protect the plant from frost during the first Winter by a covering of light cloth or branches of Cypress or other evergreen. There are numerous varieties of the Fuchsia, some of them of large size, very free-flowering and of all shades of red, purple and white.

Gazania

This showy perennial is a native of the Cape of Good Hope and is perfectly hardy, thriving in any garden soil and being an excellent plant for forming borders to walks, or for planting in rockeries.

Propagate by cuttings placed in a cold frame, in September or October, in the open ground in a well-sheltered place, in soil composed of half sand and half light loam well-mixed together; after they are rooted, plant them in a prepared bed two inches apart until wanted for planting where they are to flower.

Gerbera Jamesoni (*Transvaal Daisy*)

A remarkably handsome perennial herbaceous plant which has recently been introduced from South Africa. It grows in

heavy clumps, has leaves about one foot in length, deeply cut, and blooms almost continuously throughout the year, bearing great masses of Marguerite-like flowers which are of a bright terra cotta color and have stems about one and a half feet in length. The Transvaal Daisy should be in every garden.

Propagate by seeds sown during Spring, in soil composed of half leaf-mold, well decomposed, and half silver-sand, covering the seeds to the depth of an eighth of an inch. As soon as the seedlings have formed four leaves, they should be potted singly in two-inch pots and afterwards given larger pots as required. Propagation of the Transvaal Daisy may also be effected by division of the roots during March or April.

Geum

A genus comprising about thirty species of hardy perennial plants, very useful for forming groups in the flower-border, and for cutting for indoor decoration. They bear yellow, red or white flowers, some varieties being single-flowered and others double.

They are of easy culture and thrive in any soil. Propagate by division of the roots in Winter or early Spring, or by seeds sown, one-quarter of an inch deep, in October, where they are to bloom, thinning out the seedlings to one foot apart when they are about two inches high.

Gilia

This beautiful hardy native annual makes a most attractive mass of color when grown in a suitable place, as for example, a sunny spot in the open ground away from the garden proper, among the shrubs or in any semi-waste spot where a Spring effect is desired. It is of easy culture; in November spade the ground and, after raking it over, sow the

seeds one-eighth of an inch deep. Should the seeds germinate too thickly, thin the young plants, when two inches high, to three or four inches apart and they will require no further attention.

Gladiolus

This genus contains about ninety species which are among our most popular garden flowers, their stately habit and gorgeous spikes of handsome flowers making them indispensable in all gardens. While some are pure white, they contain a great variety of color, ranging through all shades of pink and red to dark crimson, and also including yellows and purples. Some varieties are beautifully flaked and striped. The Gladiolus should have a deep rich soil and a sunny situation and should be generously supplied with water during the growing season, while a heavy mulching of old cow-manure about the roots assists them to perfect their flowers. Each flower-stalk should be tied to a light wooden stake to keep it from being moved or blown about by winds. As soon as the leaves begin to turn yellow in the Fall, the corms should be taken up with their tips intact, and laid in a cool dry shed to become ripened, when the tops may be cut off close to the bulb, and the corms placed in boxes, covered with dry soil and kept dry and cool until planting time. Plant the first lot of bulbs in February and the next lot in May; plant them about three inches deep, and one foot apart.

Propagate by seeds sown in early Spring and covered to the depth of a quarter of an inch, or by the small corms or bulbs which form around the old corms or on the ends of the roots. These small corms should be planted in Spring in a nursery bed and grown on for a year before being planted in the flower-border.

Helianthus

This genus includes the common Sunflower and about eighty other species. The tall-growing annual species thrive

in any good soil and show best when planted among tall shrubs or trees where they have a good background of foliage. The perennial species, not being such tall growers, are very suitable for planting in clumps in the herbaceous border, where their dense masses of bright yellow are very effective.

The "multiflorus" varieties are the most popular; some of them when well grown are as large and as double as a Dahlia.

The annual species are propagated by seeds sown, where they are to flower, in early Spring. Cover the seeds to the depth of a quarter of an inch. Propagate the perennial species by division of the roots in early Spring. The annuals, when four inches high, should be thinned to eighteen inches apart, and the perennials should be planted two feet apart each way.

Heliotropium (*Heliotrope*)

A genus comprising over one hundred species (mostly herbs, only a few of them being shrubby), the common Heliotrope (Heliotropium peruvianum) being the origin of most of the large trussed varieties now in use. They are of easy culture, preferring a light rich soil with plenty of water and a sunny situation.

Propagate by cuttings inserted, in September, in sand and placed in a cool frame and kept shaded for the first two weeks. Where the temperature falls below thirty-three degrees Fahrenheit, the young plants should be protected from cold during the Winter.

Heuchera

This pretty saxifrage-like plant is very useful for Spring-flowering, its bright pinkish-red flowers continuing in bloom for months. It is also good for cutting and for filling small vases. It is of easy culture, thriving in any soil. Heuchera sanguinea will be found one of the best species for general use.

Propagate by dividing the crowns in early Spring.

Iberis (*Candy Tuft*)

This old favorite is of easy culture and not particular as to soil. Of course, it shows finer flowers and remains longer in bloom when given good rich soil than when a poor soil is used. The annual sorts are raised from seeds sown either in September or October, or in February or March. The seeds should be sown where they are to flower, and covered to the depth of an eighth of an inch, the seedlings, when two inches high, being thinned out to six inches apart each way. The perennial species, in addition to being propagated by seeds, may be increased by cuttings placed in a cold frame in October or November or by division of the roots in February or March.

Impatiens

This genus includes the well-known Balsam and the free-flowering Impatiens Sultani from Zanzibar.

The Balsam delights in a rich light soil and a warm sheltered situation away from cold winds and fog. Being an annual, it is raised only from seeds. The seeds should be sown in a hotbed or warm greenhouse and covered very lightly with finely-sifted sandy leaf-mold, March being a good month for the planting of the seeds which germinate in a few days. The seedlings should be pricked out, as soon as they are large enough to be handled, and planted three inches apart in pans or boxes; as soon as they fill the space in the boxes, they should be planted out where they are to bloom, or given more root-room so that their growth may not receive any check, otherwise their stems will become stunted and the flowers small and colorless. After planting them out of doors, give them a good watering and mulch them with well-decayed manure, giving them copious waterings at least twice a week.

Impatiens Sultani, being a perennial, in addition to being easily raised from seeds, may be increased by cuttings, taken,

in March or April, from tops of the young growths, inserted in sandy leaf-mold and placed in a hotbed or warm greenhouse where they will root in about ten days and be ready for potting. Impatiens Sultani makes an elegant pot plant, useful for decorating the greenhouse or for placing on a warm veranda.

Iresine

This very useful ornamental-leaved bedding plant is much used in outlining formal figures in carpet-bedding and ribbon borders and is considered an indispensable plant for Summer-planting. It is easily propagated by cuttings inserted under glass, in September or October, or by cuttings in the Spring, inserted in sand in a hotbed or warm propagating pit. As soon as they are rooted, plant the young plants, three inches apart in light rich soil, in pots or boxes, returning them to a warm frame or greenhouse until they take root in the soil, when they may be removed to a cold frame and gradually hardened by exposure to the open air. They should be planted out in their permanent quarters late in April or early in May.

Lobelia

This genus comprises about two hundred species, a few shrubby, many herbaceous and a large number annuals. The dwarf annuals are very useful for bordering flower-beds and for forming a ground-work for tall-growing specimens, for instance, a bed of the tall-growing scarlet-flowered Lobelia cardinalis with a carpet or ground-work of the dwarf blue Lobelia speciosa, making a charming combination.

They are all easily grown and thrive in any garden soil. The cardinalis type should be planted about one foot apart and the speciosa six inches apart.

The annual species are raised from seeds sown under glass; the seeds should be sown, in February, in soil composed of

half leaf-mold and half light loam with enough sand to keep the compost open, the soil barely covering the seeds. The seeds being very fine, the soil for covering them should be sifted through a fine sieve. Place the pots or boxes where they have a little bottom heat; when the young seedlings are large enough to be handled, prick them out three inches apart in boxes and return them to a place with the same temperature for two weeks, when they may be placed in a cold frame and gradually hardened off, then placed out of doors until April or May, when they should be planted where they are to flower.

The Lobelia cardinalis type may also be raised from seeds, but they are generally increased by dividing the roots. This should be done in February or March.

Lupinus

This hardy genus contains about eighty species, most of them American and many being natives of the Pacific Coast. The perennial species form handsome specimens in the shrubbery borders, and the annual species are beautiful in the wild garden or for planting in the flower-borders. Lupines delight in a light sandy soil, thriving even in the most barren sands.

Their propagation consists simply of sowing the seeds where they are to flower and raking the ground on which the seeds have been sown. The best season for planting the seeds is in October or immediately after the first rains.

The shrubby blue-flowered Lupinus Chamissonis and the yellow Lupinus arboreus form handsome bushes from three to six feet tall and as much through the branches. They are very free-flowering; the annual species, such as Lupinus bicolor, form beautiful masses or beds. The herbaceous species are best when grown in partial shade, in the uncultivated copse, in hedge-rows or along the banks of streams. They require no artificial irrigation.

Lychnis

This old-fashioned favorite has not been grown much of late, but as there is now a tendency to return to the old style of herbaceous borders, no doubt the beautiful Lychnis, with its many varieties of charming bright colors, will again be seen in our gardens. The Lychnis thrives in any soil, but prefers a light sandy soil and a sunny situation.

In October or November prepare the soil by digging it over and raking it smooth. Then sow the seeds where they are desired to bloom, and cover them lightly. Should the young plants come up too thickly, thin them, if the tall-growing species, to one foot apart, if the dwarf-growing species, to six inches apart.

Matthiola (*Stock*)

These popular herbs or sub-shrubs are probably the most commonly grown of any flowering plants. Their colors range from white, through all shades of pink and red, into purple and violet, another point in their favor being their delightful fragrance. There are several types or classes, some flowering in early Spring and some in Summer, while others bloom in Autumn, this depending a good deal on the time of sowing the seeds. Stocks require a deep rich soil and a sheltered situation with plenty of moisture at the roots. Plant them six inches apart, choosing a cloudy day for the operation; after planting, give the soil a good soaking of water and afterwards mulch the surface of the soil with old manure; water at least twice a week.

Stock.

Propagate by sowing seeds of Ten-week Stock early in March, in a hotbed, the Intermediate varieties in April, and the Bromptons late in July. Cover the seeds to the depth of one-eighth of an inch. As soon as the young plants are large enough to be handled, prick them out (in pots or boxes) three inches apart in light rich soil composed of one-third leaf-mold, one-third light loam, one-sixth old well-decomposed horse-manure and one-sixth soft sand, well mixed together; return them into the same temperature for about ten days, after which they should be transferred into a cold frame and gradually exposed to the air, care being taken that the young plants do not receive any check in their growth either by sudden exposure to cold or by being taken from under glass and planted in the open without first being placed out of doors for at least a week until they get over the change from shelter to exposure. Another danger to be guarded against is leaving young plants in the boxes after they have exhausted the soil, in which case the stems become hard and barkbound, thus forcing them to send up their flower-stalks which, on account of their stunted condition, are puny and weak. In short, the young plants should be kept in a vigorous growing condition from the time they germinate until planted where they are to flower.

Mimulus

This showy and ornamental genus comprises many fine-flowering annuals and a few shrubby species; one of the shrubby species (Mimulus glutinosus) may be found blooming on our hillsides nearly every month of the year. Mimulus cardinalis, with its bright scarlet flowers, is a lovely perennial, thriving best by the side of a running stream, and another of our natives is Mimulus luteus which flourishes by the banks of our ponds and lakes. The many and vari-colored varieties of Mimulus luteus are very effective garden flowers. Mimulus moschatus (the common Musk) is another species of this genus and is a well-known and favorite plant

both for growing in pots and for planting outside in clumps, or for growing a ground-work for tall-stemmed flowers such as Lobelia cardinalis.

Propagate by seeds sown (in early Spring) in the open air, where they are to flower, or by cuttings inserted (in early Spring) in a shady spot protected from wind and strong sunshine. The seeds, being very small, should be covered with soil very lightly. Mimulus moschatus is best propagated by dividing the roots in early Spring or before growth commences.

Musa

The Musas are among the very best of the large-leaved decorative plants, Musa Ensete having the largest leaves. It is much used in subtropical gardening, sometimes producing leaves over fifteen feet in length with a breadth of three feet, these, with their broad midrib of reddish-brown color, making it one of the handsomest plants in a well-kept garden. The Musas delight in a warm sunny well-sheltered situation, a rich well-manured deep soil and plenty of water during the growing season.

Propagate Musa Ensete by seeds, sown to the depth of half an inch, in a hotbed, in February or March, and potted singly in four-inch pots as soon as the seedlings are six inches high; give them more pot-room as required, planting them, in early May, where they are to remain. Musa Cavendishii, Musa coccinea and most of the other species are easily increased by dividing the roots or by taking the young suckers which form at the base of the stem, potting them, at any time during Winter or Spring, in light rich soil and placing them in bottom-heat until rooted.

Myosotis (*Forget-me-not*)

A genus of elegant annual flowering plants excellent for early Spring bedding, or, preferably, for covering the ground

among upright growing shrubs, all being of the easiest culture and thriving in any soil.

Propagate by sowing the seeds, where they are to flower, early in October, or after the first rains, covering them very lightly. When the young plants are two or three inches high, thin them to six inches apart and the result will be a pleasing ground-work of pretty pale-blue, giving a fine finish to the flower-bed or shrubbery group.

Nemophila

This early-flowering favorite is one of the best of our native annuals for filling flower-beds, clumping in the flower-borders, carpeting shrubbery-groups or covering dry banks to give natural effects. Its culture is of the simplest, all that is necessary being to sow the seeds thinly to the depth of an eighth of an inch, where they are to bloom, immediately after the first Fall rains; any soil will suit, down to the poorest sand or even a rocky ledge if the rock is loose enough to allow the roots to penetrate.

Nemophila insignis and Nemophila aurita will be found the most useful of the species for general planting.

Œnothera

Evening Primroses are among our favorite natives and are most desirable plants for the decoration of our gardens and shrubberies; planted among shrubs, where their flower-stalks and bright-colored (pink, white or yellow) flowers show against the background of shrubby leaves, the effect is very pleasing, their flowers being among the most beautiful and attractive of our native perennial herbs.

They thrive well in any soil not too shallow, and require little or no artificial irrigation. Œnothera biennis, Œnothera albicaulis, Œnothera bistorta, Œnothera ovata and Œnothera cheiranthifolia are all natives of this Coast and especially effective.

Propagate by seeds sown, to the depth of an eighth of an inch, where they are to bloom, in October or immediately after the first rains have well soaked the soil, or by division of the root-stocks in Winter or early Spring. The seeds may be sown in a seed-bed and the seedlings transplanted when three or four inches high.

The tall-growing sorts should be planted one foot apart and the dwarf species six inches apart.

Oxalis

A large genus comprising over two hundred species scattered widely over the Temperate Zone but mainly in South America, Mexico and South Africa. They are mostly used as border-plants or for covering the surface of the ground under or among shrubs.

They prefer a sandy soil and a sunny situation. All of the species are of easy culture and are propagated by division of the roots in early Spring. Plant them about a foot apart. They root quickly and spread rapidly; they should be taken up and replanted every second year.

Pæonia (*Pæony*)

A well-known genus of hardy plants, natives of America, Asia and Japan, which are excellent plants for the decoration of the herbaceous border or for groups in the shrubbery. The species Pæonia officinalis have deciduous stems and perennial roots. Their flowers, both single and double, which range in color from purple through red and pink to pure white, are very effective in grouping and are also great favorites for cutting for room decoration.

Pæonia Moutan, the Japanese species, are highly decorative, and, having a range of color quite as extensive as the herbaceous species, are also most desirable plants for planting in groups in the shrubbery or garden-border. Their flowers are of immense size, single and double, and most gorgeous coloring.

Plant them in January in heavy rich loam which is at least two feet in depth, care being taken not to cover the crown of the plant too deeply, not over one inch of soil covering the crown. During the season of growth, they should be watered generously, and the surface of the soil should be well mulched with old manure. The clumps of the herbaceous species should not be moved or disturbed more often than once in five or six years, as it is found that disturbing their roots has a weakening effect on the plants. Plant them about three feet apart each way. If left alone and in good soil they will soon form large clumps. Propagate the herbaceous species, in Winter or early Spring, by division of the roots, and the tree Moutan or Japanese species by grafting on to the roots of the herbaceous kinds in Winter.

Papaver (*Poppy*)

A hardy easily-grown genus of annual and perennial flowering plants, natives of the temperate or subtropical regions of Asia, North Africa and Europe. They grow well in any common garden soil and are excellent for cutting, for decoration indoors or for giving gay, many-colored effects in beds or flower-borders; they are also good for sowing or planting in woods or shrubberies.

Sow seeds of Papaver Danebrog, Papaver somniferum, or the Shirley species, in February, where intended to bloom; sow the seeds one-quarter of an inch deep. Thin the young plants to one foot apart, top-dressing the ground about the young seedlings with old manure to the depth of one-half or one inch; water when required.

The perennial species, such as Papaver bracteatum, Papaver orientale, etc., are propagated by division of the roots in early Spring or by seeds sown, in July, in a cold frame, pricked out in boxes as soon as large enough to be handled and planted in their permanent quarters in November.

Pelargonium

Without doubt the Geranium is the most universally grown plant to be found in our gardens, and deservedly so, its hardiness, its handsome evergreen foliage, with its ever-blooming many-colored flowers, making it a general favorite.

The Pelargonium is divided into several sections, including the common bedding or zonale, the ivy-leaved creeping section and the show or Lady Washingtons, these again being subdivided into innumerable varieties. All are of very easy culture and thrive well in any soil and in almost any aspect.

Propagate by cuttings inserted in sandy soil in boxes or beds in the open air, in September. When they are rooted, rebox them in soil composed of equal parts loam, leaf-mold and old manure, with a little sand to keep the mixture open and free.

In frostless sections, the young plants may remain out of doors all Winter; in other sections they should be placed under glass until all danger from frost has passed, and planted, where they are to bloom, in April or early May.

Pentstemon

This hardy and popular perennial is among the most beautiful of our herbaceous plants, having erect, flowering branches (two or three feet tall) and funnel-shaped flowers, the principal colors being blue, pink, scarlet, and white with all the intervening shades. The Pentstemon grows well in any fairly good soil. The flower-stalks of the taller-growing varieties should be supported by light stakes to keep them from being blown about by winds or borne down by heavy watering.

Pentstemon.

Propagation is effected by seeds and cuttings; the seeds should be sown, to the depth of an eighth of an inch, in February or early in March, in a cool frame. When large enough to be handled the seedlings should be pricked off, three inches apart, into pots or boxes, and planted out, when about four inches high, where they are to bloom. They should be exposed to full air and sunshine at least one week before being planted out of doors. Propagation by cuttings is made, in September, by inserting the cuttings either in a cold frame, where they may be shaded for the first two weeks, or in a shady spot away from cold draughts of wind, out of doors, in soil composed of half sand and half leaf-mold.

Petunia

A genus of hardy, free-flowering plants belonging to the Solanum family, natives of Brazil and the Argentine Republic. They are very showy and effective for planting in beds or masses, also for planting in waste ground or where water is not very plentiful. They thrive in any soil and require very little attention in the way of watering if the soil about the plants is kept loose and clear of weeds. If extra large flowers are wanted, give them good rich soil and a reasonable amount of water.

Petunia.

Petunias are raised principally from seeds sown in February, one-sixteenth of an inch deep, in a cold frame, pricked off (into boxes) three inches apart, and, as soon as they are of sufficient size, hardened by being placed in the open air for a week or ten days and then planted where they are to flower.

Special varieties, such as the double and finely-fringed single, are propagated by cuttings; these should be taken off in September and inserted in sandy soil, either in boxes or in the bed of the frame, and kept shaded during the middle of the day until young roots begin to form, when they should be given more air and light and gradually exposed to full sunshine. Plant them out of doors, where they are to bloom, at any season where there is no frost, and in other sections as soon as cold weather is past in the Spring.

Phlox

This brilliant native of the Eastern States is becoming a general favorite in our gardens, its handsome panicles of charmingly beautiful flowers being excellent, when cut, for the decoration of our rooms and halls. It also gives color and brightness to our flower-borders, and, where a good collection of the early or Summer-flowering perennial varieties together with the tall-growing Autumn late-flowering varieties are cultivated, a long season of continuous bloom may be had by the different kinds succeeding each other in flowering.

The dwarf species, such as Phlox subulata, are very useful for covering rock-work and for forming front lines in mixed borders.

The annual Phlox Drummondii is one of our most beautiful Summer-blooming plants. This species and its many varieties are suitable for filling flower-beds or for forming a ground-covering among taller-stemmed subjects. They (Phlox Drummondii) are raised from seeds sown in February in a warm hotbed, a little bottom-heat being of great assistance to their free germination in pots or boxes in light sandy soil. Seeds should be covered to the depth of an eighth of an inch. As soon as the seedlings are large enough to be handled, they should be pricked off into boxes and grown on

in frames until large enough to be planted in the open air. Before being planted, they should be hardened off by being placed in the open air for a week or ten days.

The perennial species are propagated by cuttings of the young shoots which start from the old stools in Spring. Take off the shoots when they make a growth of four inches and place them in light sandy soil in a cold frame, shading them for a few days during hot sunshine. As soon as they are rooted, take them out and plant them in the open border in rows eight inches apart and three inches apart in the row. These will make good plants for flowering the following season.

The most popular system of increasing the number of plants is by simply dividing the old stools into small pieces in early Spring and replanting. In planting the tall-growing species, set them out about two feet apart. In Summer a good top-dressing of old manure will be found very beneficial, besides conserving the moisture by preventing evaporation.

Platystemon (*Cream-Cup*)

This charming little annual is one of our earliest Spring flowers, flowering some years as early as January. Its lovely straw-colored, poppy-like flowers are always welcome wherever they are found.

It is propagated by simply shaking a pinch of seed where a patch of the pretty cream-colored flowers is desired, in October, or immediately after the ground has received a good rain in the Fall. Should the seedlings come up too thickly, thin them to three inches apart.

Poinsettia

Poinsettia pulcherrima, the most showy of the species, is a general favorite, during December and January, for the decoration of our halls and dinner tables.

In the northern counties the Poinsettia is treated as a greenhouse plant; from Santa Barbara south it gives grand results when grown in the open ground, its great scarlet bracts often being twelve inches or more in width and the plant itself frequently growing ten feet high and six feet wide.

Poinsettia.

Portulaca

This old favorite, popularly known as Purslane, is sometimes used in salads but generally is grown for its gaily-colored flowers of purple, yellow or pink. A near-allied species, the Calandrinia caulescens, is a native of California and grows abundantly all over the State.

Its cultivation, like that of the Portulaca, is very simple; after cultivating the ground, sow the seeds thinly and rake the ground lightly to cover the seeds, any time between the fall of the first rains and the first of February. This will insure a bed of bright flowers in Spring and early Summer. Thin the plants to eight inches apart as soon as they are large enough to be handled.

Potentilla

This pretty little perennial-flowering plant is found very useful for planting in the herbaceous border and among shrubs where its bright single and also double flowers are

very attractive. It grows well in any good garden soil but prefers a light sandy soil or a situation among rocks.

It is easily propagated by dividing the roots, in early Spring, or by seeds sown, to the depth of an eighth of an inch, in the Fall, where they are to bloom, and thinned to six inches apart.

Primula

A genus comprising between seventy and eighty species of hardy perennials. The common Primrose, the Cow-slip, the Chinese Primula obconica, the Primula japonica, besides many others, are charming early-Spring flowers, often opening their pretty yellow, mauve, brown or white blossoms as early as January and continuing in flower for months. Many of the double varieties are very floriferous, almost hiding the foliage with their beautiful white, pink or purple blossoms. The Primulas delight in a shady, moist situation facing the East or North, in a light rich soil. Plant them one foot apart.

Primula obconica

Propagate by seeds sown in Spring, covered to the depth of one-eighth of an inch, and kept growing in pots or boxes or a sheltered, shady border until Fall (when they should be planted where they are to flower) or, where a stock of old plants is at hand, by dividing the roots in the Fall.

Pyrethrum (*Feverfew*)

This hardy herbaceous perennial is best known here by the variety named the Golden Feather which is much used in bedding and as front lines to ribbon borders, etc.

Pyrethrum roseum, used in the manufacture of insect powders, has rose-colored, single, Marguerite-like flowers which are exceedingly handsome. There are also many varieties with double flowers and tall erect stems, very useful for cutting for inside room decoration. Their cultivation is simple, any good garden soil suiting them.

Propagation is effected by seeds sown a sixteenth of an inch deep, in February, in a cold frame, or in March with a little bottom heat; prick the seedlings out in boxes or sheltered borders until they are large enough to be placed in their permanent quarters. Pyrethrum roseum and other tall-growing sorts may also be increased by taking up the roots, dividing them into sections, replanting them one foot apart and top-dressing the surface of the soil with old manure.

Reseda (*Mignonette*)

This universal, favorite, sweet-scented annual is one which ought to be seen in every home garden. It will grow in any good garden soil, but, if fine flower-stalks are expected, the soil can scarcely be made too rich.

Propagate by seeds sown where they are to flower and covered to the depth of a quarter of an inch. February is a good season for the sowing of the first crop, and another sowing should be made in July; these two sowings will keep up a continual supply of flowers during every month of the year, provided the plants are not allowed to seed. In sowing, it is a good plan to rake the ground finely and sow the seeds in drills about one foot apart, the drills to be drawn the shape of the bed or patch desired, whether circular, oval or other form. When the plants are three inches high, thin them to one foot apart and mulch well with old manure, giving water when required.

To those who have limited space, this little favorite will be found very accommodating, as it does well even in a window-box if given an Easterly or Northern exposure, requiring a

good, rich, light soil and plenty of water, care being taken, however, not to get the soil soggy or sour.

Rosa (*Rose*)

This important genus of highly ornamental flowering shrubs is widely distributed over the Temperate Zone It is divided into many sections or groups, these again being divided into numerous varieties. No one of our ornamental flowering plants is more worthy of attention from cultivators or flower-lovers than the Rose. It is well named the Queen of Flowers, and is useful and beautiful in the many positions it is called upon to adorn, provided it is given fair treatment in the way of soil and cultivation. Some of the groups will be found suitable for almost any situation:—covering trellises or arbors, covering walls or verandas, in mixed borders or as bedders. A number of the stronger-growing species (such as the Ramblers, the Cherokees and the Banksiæ) make grand effects when allowed to grow wildly among the branches of a spreading oak or a tall pine, their showers of white, red or yellow blossoms almost covering their own leaves, as well as those of the tree which gives them support. The Rose is propagated by seeds, cuttings, layers and budding, but by cuttings is without doubt the best system for increasing the great majority of the finer varieties. Roses of nearly all the varieties do well on their own roots, and propagation by cuttings may be carried on during the Summer and Autumn months. The first batch should be put in as soon as the first crop of flowers is over, and half-ripe wood is in condition, which is generally as soon as the flowers drop from the young growth and before the buds on the flowering shoots begin to swell. Cuttings of this wood make excellent material and should be about six inches in length, if taken off with a heel so much the better. The cuttings should be inserted in a cool, shaded border free from draughts, in soil composed of half sand and half leaf-mold. When making the cuttings in the Summer season, the leaves should be carefully preserved.

Plant the cuttings in rows about twelve inches apart, and three inches apart in the row

The tea-scented and most of the Japanese and Chinese species and their varieties root well if the cuttings are taken in September and inserted in prepared soil in a border facing the North or in boxes eight or ten inches deep; the soil should be of a light sandy nature, covered with about one-half inch of pure sand and well-watered. After the cutting-bed has been prepared and the soil watered, take off the cuttings and insert them in the soil at once; then give a good watering to settle the soil about the cuttings.

The Hybrid Perpetuals and other hardy sorts root well if the cuttings, at the time of pruning, which is in November or December, are put in nursery rows in the open ground; use the previous year's wood in about eight-inch lengths, planting the cuttings six inches deep and leaving about two buds above ground; soil of a light sandy nature should be used in the cutting-beds.

Propagation by budding is effected by taking a bud of the variety to be propagated and budding it on the Manetti or some other strong grower, selecting a time when both the stock and the bud are in proper condition, that is, when the bark lifts or parts easily from the wood, which is generally in April or May, care being taken that neither the stock nor the bud is bruised during the operation.

Propagation by Seeds is resorted to only when it is desired to raise new varieties. Sow the seeds to the depth of a quarter of an inch, in January, in the open border in a sheltered spot in well-prepared, light sandy loam. The seedlings will appear in Spring or Summer. Should they come up too thickly, thin them out to about one inch apart as soon as they are large enough to be handled, and transplant the thinnings to where they can be shaded till again established. The following Spring, as early as the state of the ground will permit, take up the seedlings and plant them in nursery rows, cutting each of them back to one or two inches; plant them six inches

apart in rows one foot apart. When the plants come into bloom, all those with poor flowers should be discarded and the most promising preserved till their true merits are thoroughly tested.

Propagation by layering is not much practised. It is best performed in May or June. Cover the bend with sandy soil and keep moist until rooted. When the layers are well-rooted, sever them from the parent plant and plant them in a sheltered border until a permanent position is prepared for them.

To grow Roses well, a deep rich soil must be used. The Hybrid Perpetuals require a strong, loamy soil, one and one-half or two feet in depth, well drained. In places where good soil is not found and rose-beds are to be formed, it will be necessary to remove the natural soil and replace it with the loamy soil; when this is done and the soil is satisfactory, it should be well enriched with old manure and the whole trenched to the depth of two feet; the operation should be carried out in the Fall. Before planting the young Rose plants, about February, first dig the ground over, breaking up all the big lumps or clods, then plant out the young plants about three feet apart, selecting a time when the soil is in good order and not wet or sticky. After planting, if the soil is inclined to be dry, give a good watering and mulch the ground with a top-dressing of two inches of half-rotten manure.

Climbing Roses of the Rambler and Banksiæ, as well as the Cherokee types, also prefer a strong loam and plenty of manure. The tea-scented, the everblooming, and the Chinese types seem to do best and give their finest flowers in soil of a lighter nature, a light sandy soil well-enriched with old manure suiting them admirably.

During dry weather in Summer, while the Rose is making its growth, it should receive a generous supply of water at the roots. At no season should the roots of the plants be allowed to become dry as this weakens the growth, and the

young wood does not ripen firmly, while next season's growth starts feebly and the flowers are poor and colorless.

The pruning of the different species varies according to the habit of growth and the purpose for which they are used.

The Pillar Roses (those that are used in covering stumps of old trees, trellises, etc.) which are generally strong growers (under fair conditions, making an annual growth of from six to twenty feet) must be treated differently in the way of pruning from those which are naturally of a bushy, dwarf habit. The Climber is grown for the purpose of covering large areas and to give great showers of bloom, whereas the dwarf kinds are grown mostly for their fine form or size, individually, or in clusters of from three to six in a cluster. In pruning the Climbers, in December or January, all that is necessary is to thin the shoots of any weak or worn out or dead or surplus branches and shorten the previous year's shoots by cutting off the soft or unripened tips, on the other hand being careful not to thin too freely thus exposing too much of the wall or trellises on which they are trained.

The Hybrid Perpetuals, the Bourbons and the tea-scented sections which are grown in beds or borders and are desired for their individual flowers, should be pruned back in December or January each year, leaving only from four to eight buds on each shoot of the previous year's growth.

When the bushes are four or five years old, it will become necessary to thin out some of the old stems, but only enough to keep the middle of the bush from becoming crowded too much; this admits light and air to each growth and encourages stronger stems and finer flowers.

Should, as is very often the case, the plants show a tendency to make weak, spindly growth, it is a good plan to take them up in early Spring and either transplant them into new soil or trench the ground over (enriching it with a plentiful supply of old manure) and replant them after cutting them well back and trimming in the roots, pruning off any which are dead or diseased.

The Rose is subject to several diseases, the worst of which is Mildew; this should be attended to at once and not left until all the leaves are attacked, but, as soon as the first speck of Mildew is observed, the whole of the plant should be sprinkled with a dusting of flowers of sulphur. The Rose-rust is another disease which frequently attacks the leaves; it forms on the underside of the leaves in red dots or small masses. As yet no cure has been found for this disease, so as soon as a leaf is found with this rust upon it, it should be picked off and not merely left on the ground but should be burned up to prevent the disease from spreading to other plants.

The Rose is also attacked by several species of Aphides, commonly called green or brown fly. These should be got rid of by syringing with strong soap-suds in the evening and washing off in the morning with the hose; this operation should be continued each evening until the fly is all cleaned off. A solution of tobacco water is also effective, and sometimes dusting the leaves with tobacco dust will have the desired effect.

When caterpillars infest the leaves, they generally coil themselves in the folds of the leaves. Press the affected leaves firmly between the finger and the thumb, thus killing the caterpillar, or the leaves can be picked off and burned.

Salpiglossis

This ornamental native of Chile is a general favorite in all gardens on account of the odd coloring of its tube-shaped flowers. It thrives best in a light rich soil where the plants should be one foot apart.

Propagate by seeds sown in a gentle bottom heat in early March; cover the seeds very lightly. Prick them out three inches apart into pots or boxes as soon as the seedlings are large enough to be handled, keeping the young plants close

and shaded for a few days until they take root; gradually harden them off by exposure to the open air, and plant them, where they are to bloom, when they are from four to six inches high.

Salvia

This brilliant, Autumn-blooming, bedding plant is indispensable where bright color effects are desired. The Salvias thrive in a light sandy soil well-enriched with old manure and are kept growing by generous supplies of water at the root.

Propagate the shrubby varieties by cuttings, in September or October, inserted in sandy soil in a cool frame and kept shaded during sunshine until rooted. Where the temperature falls to the freezing point, the cuttings should be kept under glass until all danger from frost is over, when they may be planted where they are to bloom. The tuberous-rooted species (such as Salvia patens) are propagated by cuttings taken from the young shoots which start from the crown in early Spring; these should be placed in a warm house or frame until rooted; they may also be increased by dividing the roots in Spring.

Saxifraga

A large genus of hardy perennial herbs, very useful for planting in rockwork where they form beautiful and interesting effects. Saxifraga palmata, probably the largest-leafed species of the genus, is a native of California, growing on the banks of our streams and creeks; Saxifraga sarmentosa (Aaron's Beard), an old favorite, is much used in hanging baskets or in forming borders.

They thrive in any soil under ordinary care, and are easily propagated by dividing the roots or by seeds sown in the open ground in early Spring, the seeds being covered very lightly.

Scabiosa

This hardy perennial herb is of easy cultivation and grows in any soil with little care, having the good quality of requiring little water.

Propagate by seeds sown, in early Spring, where they are to flower; cover the seeds to the depth of one-eighth of an inch. Thin the young plants to one foot apart when they are large enough to be handled. They may also be increased by division of the roots in February or March.

Silene (*Catchfly*)

This genus comprises over two hundred species, only a few of which are adapted to conditions in California. Among the best may be named Silene pendula and Silene compacta; both of these give fine effects in early Spring and thrive in any light sandy soil.

Propagate by sowing the seeds, where they are to bloom, in September or October. The seeds should be covered to the depth of one-sixteenth of an inch. Thin the seedlings, when two inches high, to six or eight inches apart.

Tropæolum (*Nasturtium*)

Highly ornamental climbers or twining plants, introduced from South America. They are among the most useful of our annual-flowering plants, requiring very little attention and thriving in any soil. For quickly covering arbors or anything which is unsightly, the tall-growing species are not easily surpassed. The dwarf bushy species are excellent for planting as a groundwork among shrubs, or for filling beds in semi-dry situations as they continue to bloom quite late in Summer if the ground is well cultivated and mulched with a top dressing of manure, leaf-mold or other loose fertilizing material.

Sow the seeds, one-quarter of an inch deep, where they are wanted, at any season between the first rains and March in

the frostless belt, and as soon as danger from frost is over in other districts. Nasturtiums should not be sown in rich soil as in such they grow too much to leaves and stems, flowering more profusely if their growth is not too strong.

Tropæolum tuberosum, Tropæolum speciosum and other tuberous-rooted species do not seem to take kindly to California, although no good reason has yet been given for their failure; being natives of Chile and the cooler districts of Peru, they ought to do splendidly. They are all handsome climbers and no doubt they will yet give good results when the proper conditions are found for them.

Verbascum (*Mullein*)

A genus comprising over one hundred species of hardy biennial herbs or subshrubs. Some of them are exceedingly handsome, the stately spikes of brightly-colored flowers being very ornamental, especially when grown among shrubs. They thrive in any soil, all that is necessary being, in early Spring, to sow the seeds, one-sixteenth of an inch deep, where wanted, and to thin the young plants to one foot apart when they are two or three inches high.

Verbena

A genus embracing eighty species of hardy perennial herbs or subshrubs, being among the best of our bedding plants and blooming continually for months at a time. Their colors range through all shades of purple and blue, through reds and pinks to the purest white. Their habit is low and spreading, making excellent groundwork for flowering-plants with tall stems.

Verbena.

They are propagated by seeds sown in a gentle heat, in early Spring, and covered to the depth of an eighth of an inch. When the young plants are large enough to be handled, they should be pricked off, three inches apart, in pots or boxes. Use soil composed of one-quarter leaf-mold, one-half good friable loam and one-quarter old well-rotted horse- or cow-manure with enough sand to keep the whole free and open. Before planting out, place them in the open air for a week or ten days to harden them; plant them when from four to six inches high. They may also be increased by cuttings late in the Fall, and again in Spring. All species of Verbena like a good rich soil and a liberal supply of water. They should also be mulched around each plant with half-rotted manure to encourage vigorous growth.

VIOLA (*Pansy*)

This popular plant is a favorite of rich and poor alike, everyone, who has a garden, growing a few Pansies. This is deservedly so, in view of its wonderful variety of color and its free-flowering habit together with the ease with which it may be grown. The Pansy delights in a cool moist situation, and generally gives its best flowers in cool damp weather in early Spring. As soon as the hot dry weather commences, the flowers become small, and the growth spindling and weak. The soil for Pansies should be of good strong loam enriched with a generous addition of well-decomposed cow- or horse-manure.

Pansy.

Plant, in October, one foot apart, and give a good mulching of old manure after planting; as the Pansy thrives best in

a moist cool soil, watering should not be neglected, and the soil must be kept moist at all times; if the soil is allowed even once to become dust-dry the crop for that season will be injured.

Propagate by seeds sown, to the depth of an eighth of an inch, in a cool frame or lath-house and shaded from the sun by the glass being covered with burlap or other shading material. July is about the best season for sowing the seeds. This will allow the grower to have strong bushy plants ready to be set out by October first, or as soon as the Summer-blooming flowers are over, when the Pansies may take the place of those finished blooming, and occupy the ground through the Winter and early Spring; along the cool coast counties a second sowing may, in January or February, be made for Summer-flowering. As soon as the young plants are large enough to be handled, they must be pricked out in beds or boxes in light, rich soil composed of one-third good friable loam, one-third leaf-mold and one-third equal quantities of sand and old manure, the whole being well mixed together by being turned over several times. It is important that the young plants be well rooted, and planted with a good ball of earth adhering to the roots.

Varieties of Pansies are divided into three sections, viz.: Selfs, White-grounds and Yellow-grounds.

Selfs are all of one color and are either black, maroon, white or yellow. White-ground and Yellow-ground varieties are those which have a large dark center, then a central ring of white or yellow, and an outer band of dark color.

The fancy division has the various colors and tints curiously blotched, striped, and edged. Still another section, though not the true Pansy, is the Viola cornuta, or horned-violet, which, with its many showy self colors, makes an excellent bedding plant during the Summer months.

Viola odorata (*Violet*)

This favorite, sweet-scented Winter and early-Spring flower is grown by everyone who cultivates a garden whether in a twenty-five foot lot or in grounds of many acres. In the cooler portions of the State it thrives well in open, sunny situations, while in the hotter and dryer sections it grows best in shaded spots or in a situation facing the North. The Violet prefers soil of a light loamy nature well-enriched with plenty of old manure.

Propagation is by runners taken off the old plants about the first of March. After the ground is spaded and leveled, it should be raked fine and the young shoots planted from six to twelve inches apart, the strong growers (such as the California, Princess of Wales, etc.) twelve inches apart, and the Neapolitan, Marie Louise, etc., six inches apart. Should the weather be dry, the young plants should be given a thorough watering; about the beginning of June give the surface of the ground a mulching of old manure an inch deep, and water frequently, not allowing the ground to get dry at any time during the growing season.

The operation of replanting should be attended to each Spring as the old plants get worn out and weak if left in the same ground two or more years.

Zinnia

The Zinnia, a native of Mexico, is one of the favorite flowering annuals, growing easily and being much used in the decoration of the flower-border and also for bedding. It thrives best in a deep rich soil and a sunny situation.

Sow the seeds, one-eighth of an inch deep, in a warm greenhouse or frame in early March, or in the open border in April. When they are two inches high, prick off the young seedlings four inches apart, in boxes, if they have been raised under

glass, or, if sown where they are to bloom, thin them out to one foot apart. About the first of June top-dress the surface of the ground with old manure and give abundance of water during the growing season. If mulching is objected to, keep the soil hoed after each watering, to prevent it from baking and cracking. The Zinnias, from the time the young plants germinate, should be kept growing freely; at no time should they be allowed a check either from poor soil or from want of water, as the least check to their growth causes them to throw poor small flowers, and they never seem to do well afterwards.

CHAPTER XV

PONDS, LAKES AND THE WATER GARDEN

WHERE grounds have the required space, water effects should be introduced, nothing in nature being more brilliant in its effects than water, whether in motion, tumbling in creek-form, which perhaps is the most striking of all, or in repose in pond or lake.

The size or extent of the body of water should of course be in proportion to the extent of the improved grounds. A glimpse of a river or creek in the background gives a wonderfully grand finish to an ideal landscape, while a modest water effect in pondshape adds a charm to the smaller garden or grounds such as nothing else can possibly give.

In very few places are fine water-effects more appreciated than in the middle and southerly counties of California. This is accounted for by the great lack of rain during several months of the ordinary year, say from April to October, when the whole State from Butte to San Diego is dry, brown and dusty, and, consequently, the pleasure from the prospect of a gushing fountain or a running creek or river is greatly enhanced, such a water-effect, in fact, being a positive relief to the eye. Every village and hamlet should have its fountain-basin, as well as its drinking-place for horses and dogs, filled with clear water, for practical use and as a pleasing and effective ornament.

Before making an artificial pond, first decide upon the site, the size, the shape which it may assume, the depth of water and the mode of construction. The proportion of water-effect in the garden-plan should be, as nearly as possible, one in ten; for example, in a garden of four acres, from one-quarter to one-half an acre should be water.

It is hardly necessary to say that all these details as to the pond should first be carefully planned on paper, to scale. If the garden is laid out in the natural style, the outline of the water-surface should assume an irregular shape with deep bays and promontories, not only for the purpose of giving variety to the outline but also in order to have the opportunity of placing plants of different character in the locations best adapted to their requirements and habits, for some plants give better effects when planted on a bold point projecting into the water-line than when planted in a hollow or at the head of a bay, while others, which are low-growing, give much better results when planted close to the water and along the margin of a bay shore.

In laying out a piece of water, there should be no straight or regular lines, that is, no point of land should be exactly a duplicate of any other point on the same pond, nor should there be a repetition of the shape of any of the bays or indentations along the shore line.

After staking out the shore line, next clear the ground of any brush, stumps or rough weeds, and excavate to the required depth which should be at least three feet in the deepest part, gradually getting more shallow as the shore-line is approached. If the soil thus excavated is of good quality it will be of value for dressing any poorer ground in the neighborhood.

After the excavation work is done, smooth and level the entire surface of the bottom and sides. Should the soil be of a loamy, rocky or sandy nature or at all porous, puddling-clay of a total thickness of six inches must be laid evenly over the entire surface, this being spread in two layers, first one of four inches thick and then a finishing coat of two inches. The clay for the puddling should be free from all rock and should contain not more than twenty-five per cent of sand. After the first layer of four inches has been spread, the next operation is to break the clay up with picks and hammers until all lumps are broken, when a good soaking with water must be

given. Then with a tamper not greater than one and one-half inches in diameter at the lower end, give the whole mass a thorough tamping until it is of the consistency of putty as used for glass setting. After the first layer has been puddled into shape and tamped firm and smooth, spread and treat the second layer in the same manner, finishing it with a flat tamper about six inches square at the lower end. This will give the whole a perfectly smooth finish.

On the surface of the clay, it is well to spread a layer, one inch thick, of screened rock (say of about one-half inch in size) to protect the clay from being disturbed by washing or by poles or rods being driven through the clay-bed thus making holes through which the water would escape.

Where the pond is small, a thin layer of concrete should be spread on top of the rock, as it makes the work of cleaning away sediment or dirt much easier.

In addition to the overflow pipe, there should be, for convenience in cleaning out the pond, a pipe of at least six inches in diameter, placed in the bottom at the lowest spot of the pond, on the inner end of which pipe a strainer should be screwed to keep leaves or other litter from entering and thus choking the pipe. Of course drainage pipes are useful only where sufficient fall can be had in the ground adjoining the lake. Where a sufficient fall cannot be had, drainage pipes will not be of any use and should not be put in.

Where the grounds are laid out in a formal manner, the pond should also be made formal in shape, either circular, like some fountain-basins, with granite or concrete copings, or octagonal, or of some other architectural design in keeping with the surroundings.

When the lake or pond is ready for the water, the next study is what plants, if any, should adorn the surface of the water and how they should be arranged. Before turning in the water, and where it is decided to plant Water Lilies, it is well to have basins constructed for holding the amount of soil necessary for growing these very interesting and beauti-

Small Lake with Pampas Grass.

ful flowers. These soil-boxes or basins should be made, if possible, of brick or concrete and should be about fifteen inches deep and four feet square. Fill them with soil composed of one-half rich surface loam and one-half old well-decomposed cow- or horse-manure, the loam and the manure having been first thoroughly mixed together, a month or so before being used, by being turned over several times. Fill the boxes to within two inches of the top and top-dress with one inch of coarse gravel.

After setting out the Water Lilies (which should be in early March) and as soon as the roots are planted, turn in the water and fill the pond until the water covers the boxes three inches, keeping the water at that level until the plants begin to throw up their young leaves when the pond may be filled to the surface or the level designed.

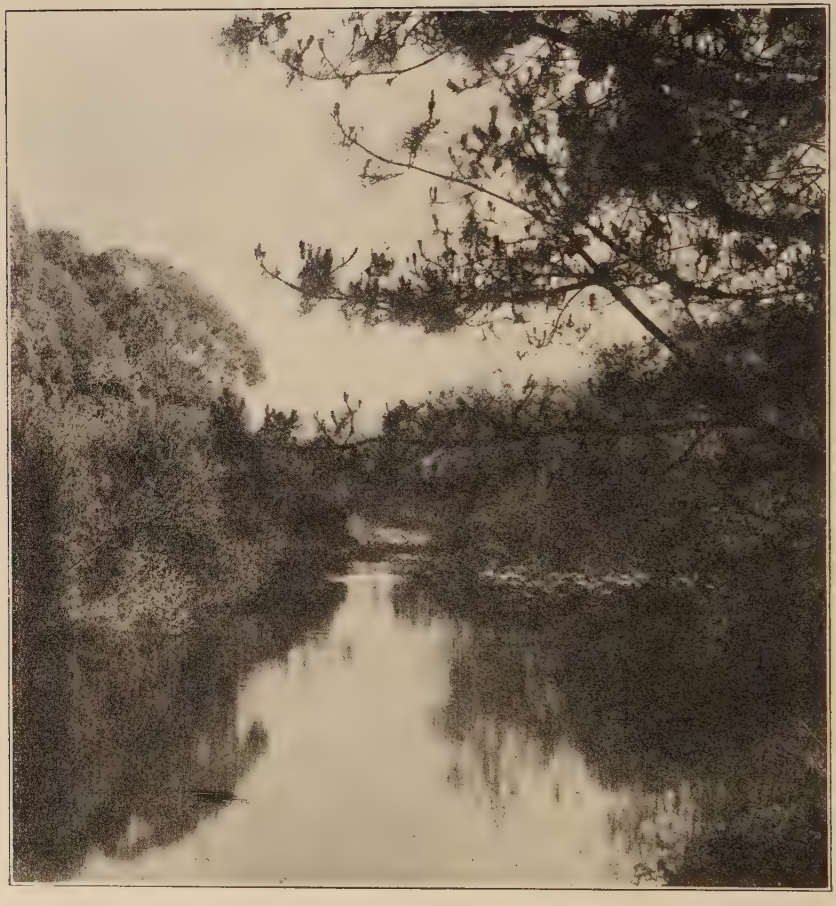
The planting of the margin should now also be attended to, the semi-aquatics such as the Japanese Iris, the Papyrus antiquorum and the Calla being set out nearest the water or where the water is not more than a few inches deep. On the promontories may be planted Bamboos, Arundos, Birches, Willows, Pampas grass, Eulalias, and, where the grounds are very large, the Swamp Cypress of Louisiana (Taxodium distichum).

In planting out the Water Lilies place the Nelumbiums in the largest basins and the smaller-growing Nymphæas in the basins nearer the edges.

The Nymphæa odorata, a native of the Eastern States, will be found one of the best for general planting, having beautiful pure-white flowers of delicious fragrance. There are several varieties of this lovely species, including Nymphæa carolinensis with petals of delicate pink, a good grower with large flowers. Another charming variety is Nymphæa exquisita, a moderate grower with rose-colored flowers, while Nymphæa sulphurea, with yellow flowers, is one of the very best for cultivation in our ponds, its flowers being large and standing up clear of the water from six to eight inches and its

leaves being beautifully mottled with chestnut-colored spots.

Nymphæa tuberosa, a native of the Western States, has a beautiful flower pure-white and sometimes as large as nine inches across. This species should be planted where the water is from four to five feet deep, and its roots should be kept from mixing with the smaller growers, otherwise it will starve them out and choke them. There is a rose-colored variety of



Small Lake Bordered with Willow and Pine.

this species which is identical with the original excepting in the color of the flowers.

Nymphæa alba and its varieties are also very desirable, all having beautiful flowers and handsome leaves, among the best being Nymphæa candidissima with pure-white flowers of large size standing clear of the water. A new variety, Nymphæa fulgens, as its name implies, is a brilliant crimson with flowers beautifully cupped; this variety should be in every collection. Nymphæa rosea is another charming variety with flowers varying in color from pink to purple.

Then there are the Marliacea Hybrids most of them bearing large flowers in many shades of color, some pink, some red and some yellow, while others have stamens of a different color from the petals making effective combinations.

Nymphæa cærulea, a distinct species with blue flowers and yellow stamens, ought to be in every collection.

Nymphæa zanzibarensis (the Royal Purple Lily) is without doubt one of the finest of the Water Lily family, being a strong grower and a free bloomer with rich purple stamens and petals of intense blue, and having a very sweet odor. The foliage is a rich green, the under-side being purple. This species has a rose-colored variety, which, on account of its color, is also very desirable.

Nymphæa devoniensis and its varieties are another class which add much to the attractiveness of the water-garden as they are night-flowering. They are very vigorous growers and free-bloomers, the flowers, under good cultivation, growing sometimes to a size of twelve inches across; they are of a bright rosy red and are borne on stems well above the water.

Nymphæa Lotus, from Egypt, is a beautiful white-flowering species also blooming in the night.

Nymphæa dentata, another white-flowered species, is one of the best and largest of the night-flowering varieties; it has serrated leaves of deep green.

Victoria regia, one of the most remarkable productions of the vegetable kingdom, is a native of tropical South America.

It bears leaves from five to seven feet in diameter with a vertical rim from three to six inches high. Its deliciously fragrant flowers measure from twelve to fifteen inches in diameter and open about five o'clock in the evening, closing the following morning about nine o'clock, reopening about five or six o'clock the same afternoon and closing, for good, the morning of the second day. The first time the flowers open they are white slightly tinted with pink, the second time they open they are of a rosy pink. To grow well, this species or any of its varieties must have a sunny, sheltered situation, and the water must be kept at a temperature of about eighty degrees Fahrenheit, which of course necessitates artificial heat, this being produced by hot water pipes running through the tank or pond in which the Victoria is to be grown.

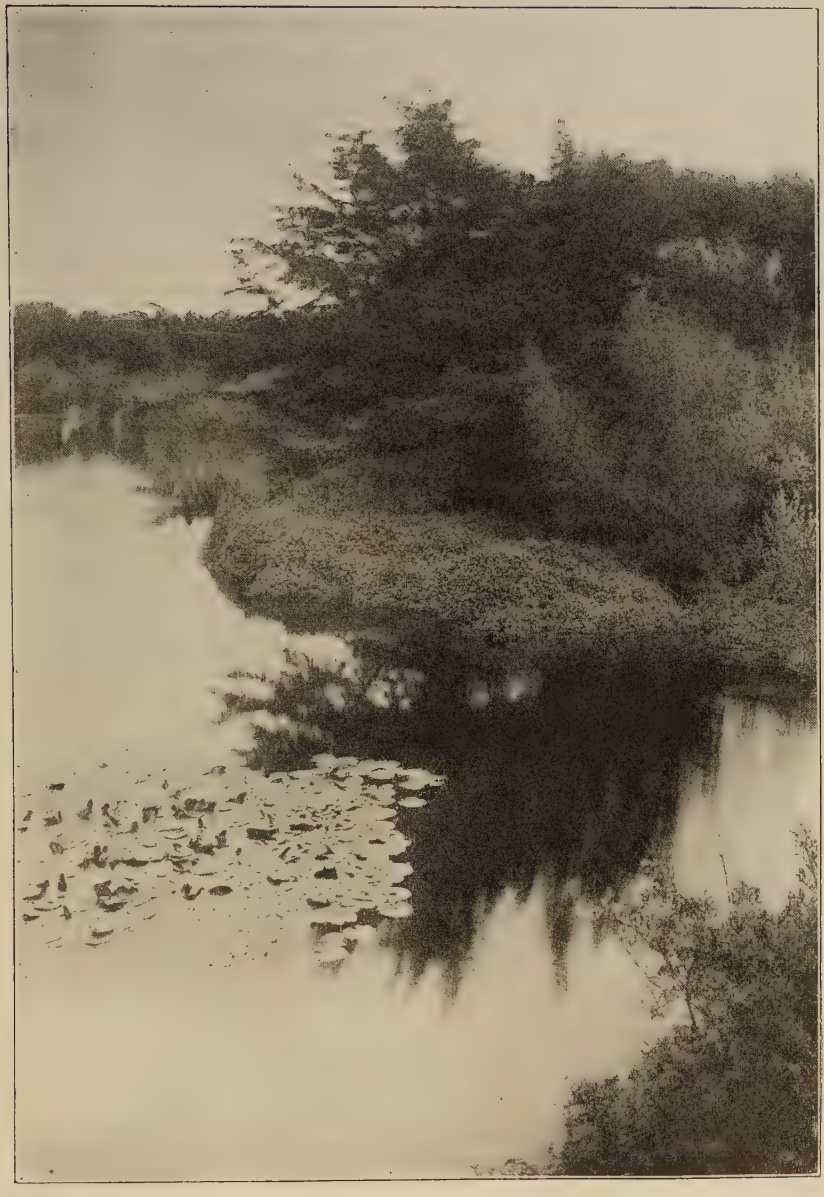
Nelumbium speciosum (Egyptian Lotus) is one of the best of the species, being a vigorous grower and a free bloomer with flowers of rosy pink.

Nelumbium luteum (the American lotus) is not quite so strong-growing as the Egyptian species, but, on account of its color should be in every collection; its flowers are pale yellow.

There is also a white-flowered, strong-growing species, named Nelumbium album grandiflorum, whose white flowers make it very desirable, as they contrast well with the pink flowers of the Egyptian.

The Nelumbiums all like a well-sheltered situation and plenty of space to show to advantage.

Propagate by seeds sown, in February, in pots filled with light sandy soil, the seeds being covered about one-quarter of an inch deep; submerge the pots, covering them to the depth of about three inches and keeping the water at a temperature of about seventy-five degrees Fahrenheit. When the seedlings have made two or three leaves, pot them singly in three-inch pots, using a slightly richer soil than was recommended for the seed pots; as soon as they have filled the pots with roots, give them larger pots; plant out the hardier spe-



Pond with Lilies.

cies such as Nymphæa alba or Nymphæa odorata in April, and the Nelumbiums a month later.

Propagation may also be effected by division of the roots or rhizomes, in early Spring, before growth commences; plant at once where they are to bloom.

Babylonian Willow.

CHAPTER XVI

PARLOR GARDENING

THIS chapter treats of various kinds of vase-plants suitable for halls and apartments, and how to grow them.

In order to be successful in growing plants in the halls or ordinary rooms of the dwelling-house, we must select those accustomed naturally to the strong heat of tropical and semi-tropical regions, as they stand the dry and dusty air of a living room with a temperature varying from fifty to seventy-five degrees Fahrenheit.

It should perhaps first be stated that if the plants are intended to be kept close to the glass of the windows and exposed to the Southerly sun, a class will have to be selected different from those which can be grown successfully if placed either in the middle or toward the side of the room where they will be partially shaded.

Among the latter class, that is, those which thrive well in the middle or side of the room, and, while enjoying the light, are injured by the direct rays of the sun shining through glass, may be mentioned that best of all parlor vase-plants, Kentia belmoriana, the ideal condition and exposure for this plant being in a room facing the West, the pot being placed on a level with the window-sill about three feet from the glass. The window-shade should be kept up all day until the sun gets round, when it should immediately be pulled down and left down until the sun leaves the window, at which time it should again be raised.

Among other plants which do well in similar conditions and with similar treatment may be mentioned the Rubber Plant (Ficus elastica), Dracæna terminalis, Pandanus utilis,

Dieffenbachias and Alocasias, also some of the stronger-growing Marantas, such as Maranta zebrina, Maranta bicolor and Caladium esculentum.

Bamboos make most effective hall plants when well grown. They also stand shade well. Another favorite which thrives under all conditions is the Aspidistra lurida, and mention should be made of the Aspidistra lurida variegata, whose broad sword-shaped leaves have a fine effect either in a hall or a sitting room.

The Cocos plumosa, Seaforthia, Corypha australis, Latania borbonica, Areca lutescens, and Areca Baueri, also Rhapis flabelliformis (the Japanese cane palm) are all satisfactory in the decorating of apartments.

In a general way it may be stated that most of the plants which carry thick, leathery, smooth foliage are satisfactory and are easily grown, whereas most of the plants which have thin, transparent foliage, or those of hairy, downy or russety texture do poorly. The dust sticks to the fibres of the thin leaves and to the rough surface of those which have a downy or hairy texture, and, as this dust cannot be washed or sponged off, the pores get choked up and the leaves turn yellow on account of their lungs being clogged, so that unless taken where the air is free from dust the plants will sicken and die.

Among window plants which stand a little sun and, as a rule, thrive well, may be mentioned the shrubby Begonias, Geraniums, Petunias and Nasturtiums. Few of the Fern family are happy in the dry air of our apartments, although some of those with leathery, smooth foliage do well for a time. The Boston Fern (Nephrolepis exaltata), Pteris cretica and Pteris argyræa are among the best for this purpose. For shady nooks or verandas many Ferns do extremely well, the Five-finger Fern and the Woodwardia making excellent growth.

CHAPTER XVII

THE WINDOW BOX

A GREAT many people, especially of those residing in in large cities, have neither the room to grow well, nor perhaps the money to spare for the purchase of expensive palms or vases for the decoration of their sitting-rooms. But all have a window and a window-sill where a surprising number of different kinds of handsome foliage and flowering plants may be grown well. Even if the window-sill be no wider than six inches, a very good window effect may be had, and nothing adds more to the appearance of a building than a few window boxes.

The window box should not be narrower than six inches, with a depth of about eight inches, and should be as long as the width of the window. After the box is made, bore holes about one inch in diameter and about five or six inches apart in the bottom of the box; over each hole place a flat piece of broken pot or a flat stone; without disturbing these flat stones, put into the box an inch of gravel or broken pot-sherds, and, over this, a layer of moss to keep the soil from mixing with the drainage material; then fill the box to within one inch of the top with soil composed of one-half good surface loam, one-quarter leaf-mold and one-quarter sharp, clean sand together with a sprinkling of old manure well-rotted, the whole having been turned over and mixed together several times before being used. In this soil set out the plants selected for the window box.

Among window plants which generally succeed well, Ivy Geraniums of various colors may safely be depended upon, as they stand rough treatment and grow well in any exposure.

Where the window faces East or North, the common Fuchsia does splendidly; the Nasturtium and the Mesembryanthemum also give fine results, while the Pelargonium zonale and the common scarlet Geranium can always be counted upon to flourish. Blue Lobelias, Heliotrope, Mignonette, Sweet Peas, the dwarf Campanulas and the Tuberous Begonias, when placed in a window facing East, will give gorgeous masses of color. Many of the dwarf Cactus, etc., also do well if given a Southern exposure.

In Spring, fine effects may be had if boxes are filled with Pansies, Violets, Hyacinths, Tulips, Daffodils and other Spring-flowering bulbs.

Great care should always be exercised in the watering of the plants; see that the soil is kept moist but not too wet. When watering, give enough water to thoroughly wet the soil but do not give any more until the soil shows signs of being dry at least one-half inch from the surface.

The window box should be overhauled once a year, the best time being in Spring just before growth commences. All of the plants should be taken out of the box, and fresh soil as well as clean drainage material put in, preferably young plants being set in the box.

When it is desirable to have a more continuous color effect than is possible with Summer and Fall-flowering plants only, it is well to have a double set of boxes, one set for the Summer and Autumn decorations and another set for the growing of plants which make an attractive showing in Winter and early Spring. Some of the popular Summer and Fall-flowering plants have already been described. Prepare the Winter and Spring boxes as suggested for the other plants and fill them with the same class of soil. Secure as early in the Fall as possible (say October 1st to 25th) a collection of Hyacinths, Tulips, Narcissus and other bulbs, and plant them about six inches apart in the boxes. The box in which the Hyacinths are planted should be set out of doors in a position facing North, given a good soaking of water, and covered

with sand to the depth (over the top of the box) of six inches. Allow them to remain in this position until they have made a growth of from four to five inches, then carefully remove the sand from the top of the box and gradually expose the blanched leaves to light and air; as soon as the leaves assume their natural green color the box may be placed in the win-

Window Boxes.

dow. Tulips and Narcissus require the same treatment, excepting that only three inches of sand, instead of six inches, will be required to cover them.

Pansies and Viola cornuta as well as Forget-me-not make excellent subjects for Winter and Spring-flowering window boxes. Sow the seeds of Pansies and also Forget-me-not in early July and plant them three inches apart in boxes as soon as they have made from four to six leaves. About November first they will be ready to be planted six inches apart in the window boxes. The Viola cornuta seeds should be sown early in June and grown on as suggested for the treatment of the Pansy and Forget-me-not.

Another charming Winter and early Spring-flowering plant suitable for decorating the window is the modest little Silene (Catchfly); sow in July and grow as recommended for the Pansy.

It may be stated that the dimensions of the box given here are for the narrowest window-sill; should the window-sill be twelve inches or more in width, much better results may be expected both in the health of the plants and the greater number of plants which may be grown.

Should insects attack any of the plants, sponge the leaves with soap-suds, and, the following morning, sprinkle them with clear water. Keep the foliage clear of dust by syringing or spraying the leaves with clear, soft water. This will greatly encourage growth and assist in keeping the plants in good health.

CHAPTER XVIII

THE AMATEUR'S CONSERVATORY

A GREAT deal of pleasure without a large outlay of expense can be derived from a small Conservatory or even a Plant-room attached to the dwelling-house. In a small Conservatory, the first requisite is perfect command of the ventilation, and the next, perfect command of the light by having the sides, which are exposed to the sun, provided with spring blinds or shades so that in clear, dry weather the direct rays of the sun may be kept off the foliage, for, otherwise, the foliage is apt to become scorched and blistered. Besides, when the air of the Conservatory gets too hot and dry, it takes away from the leaves that lively, fresh finish which is so much of the beauty of the plant carrying perfect leaves.

We build a Conservatory to enable us to enjoy the vegetation of the tropics or of countries with warmer climates than our own. Let us then fill the Conservatory with plants which cannot be successfully cultivated in the open air, and not with Roses, Carnations, Geraniums, etc.

The plants best suited for Conservatories are the finer Palms and Dracænas, the finer Ferns such as the Adiantum, the Davallia, Asplenium, the tropical Gymnogramme and many others which are easily grown in a temperature between fifty-five and eighty degrees Fahrenheit, provided they are sheltered from the direct rays of the sun, are given a moist atmosphere and are not subjected to cold draughts of air blowing through the plant house.

Special care must be given to preparing the soil for Palms. Most of the Palm family enjoy a good, strong soil, one

composed of one-half good yellow surface loam, one quarter well-rotted horse-manure, and one-quarter well-decomposed leaf-mold, with a sprinkling of good sharp sand, suiting them well. A soil composed of these parts should be turned over several times, so as to insure that all are well-mixed together.

Before potting, the pots must be thoroughly clean and dry. If the pots are new, they must be well soaked in water (being left in the water sufficiently long to get saturated) and then allowed to dry before being used. When a new pot is not soaked before being used, it frequently happens that the first few waterings, instead of being beneficial to the plant, only serve to soak the pot, while the ball of soil, which the pot contains, becomes so dry that it is a difficult matter to again get it into a satisfactory, moist condition.

One of the most common errors of amateur gardeners is to put their plants into pots which are too large. A pot which will hold all the roots, leaving one-half of an inch of fresh soil around the old ball, is quite large enough for a change of

Interior of Greenhouse.

pot; for example, if a plant growing in a four-inch pot should require a change, it should have the ball of earth reduced so that it may be repotted in one which is five inches in diammeter. Over-potting should be guarded against, as if a Palm or a Fern is given a pot which is too large, a little over-watering sours the soil and kills the roots.

In taking a plant out of a pot to put it into a larger one, the pot in which the plant is, should be turned upside down and the edge of the pot tapped gently so as to start the ball of soil. All the drainage material must be taken from the bottom of the ball. The roots must be carefully examined, and, if they are not in good health and condition, must be cut, with a knife, back into sound wood; any loose soil should be removed, and then the plant can be repotted in a pot a size larger than it formerly occupied. This, of course, is provided the roots are in good condition, as if they are not so, the plant should be repotted in a pot the same size as formerly, and should be kept in that size of pot until the plant forms fresh roots, when it should be repotted in one a size larger.

The question as to what size of pot should be used for a plant is one which is often asked. This depends not only upon the size of the plant, but also upon what kind of plant it is; for example, whether it is a plant which is a fast, strong grower, or one of slow growth; whether its roots are soft and fleshy, or whether they are of a fine, hair-like texture, etc., etc. Palms, for instance, which carry six leaves, three feet in length, will do better and will be more easily kept in a healthy-growing condition if potted in good soil in a seven-inch pot than if in one which is much larger.

See Chapter XXII, "The Calendar of Operations," for suggestions and detailed instructions as to the work in the Greenhouse or Conservatory, month by month, throughout the year.

CHAPTER XIX

TREATMENT OF THE COMMON DISEASES OF, AND INSECTS INJURIOUS TO PLANTS

DISEASES of plants are many and varied, some being the result of attacks of injurious insects, while others are caused by fungus growth which comes from improper nutrition and poor circulation or from very sudden atmospheric changes:—for example, from warm, balmy weather which encourages rapid growth, to cold, harsh winds which seem to chill the whole plant while checking its growth. The plant in these conditions suffers particularly from the fact that, on account of the soil being warm, the roots continue sending up supplies of sap of greater quantity than the leaves and soft stem (being so chilled and semi-paralyzed by the cold air) are able to assimilate, and thus there is caused a choking of the sap-vessels which greatly weakens the plant, so that it gets into a condition susceptible to an attack by any disease. Unless the weather moderates so that the plant can again make vigorous growth and throw off the attack, it may suffer severely and take weeks and sometimes even months to recover.

The most common of the fungus diseases is undoubtedly the Powdery Mildew which attacks leaves, stems, flowers and fruits. It appears like a thin white powder at first over the leaves, afterwards spreading to the stems, stopping at once and entirely the further growth of the part attacked. It is propagated by spores which increase with amazing rapidity often dwarfing and sometimes killing outright the whole plant. There are several kinds of Mildew including the Rose

Mildew, the Grape Vine Mildew, the Hop Mildew, the Pear Mildew, etc. All varieties of Mildew may be checked by dusting flowers of sulphur over the affected and the adjoining parts of the plant.

As soon as the least speck of Mildew is noticed on any part of the plant, the affected part should at once be given a good dusting, and this work should not be delayed an hour longer than is necessary, otherwise serious damage will be the result:—for example, if the plant attacked is a Rose, the Mildew, if not checked, will ruin the crop of flowers.

Bordeaux Mixture is also a good cure for Mildew, and may be used if sulphur should fail. It should be applied in the same manner as sulphur.

A sulphur bellows made especially for use in this work may be procured from any seedsman at little cost, and it will be found that the use of the bellows economizes the sulphur.

Green Flies (Aphides), sometimes called Plant Lice, are very destructive to the young shoots and foliage of plants, especially Roses on which they congregate in large numbers and send their long sharp feelers into the bark and leaves, sucking the juice from the plants. As they multiply with astonishing rapidity, they, if not destroyed, will eventually cause the destruction of the parts affected, and this in a very short time.

The best remedies for successfully getting rid of these pests are Tobacco and Whale-oil Soap; even common soap-suds, when not too strongly impregnated with soda or chloride of lime, will be found effective for this purpose if the foliage is syringed freely in the evening and sprayed with clear water through the hose the following morning. This should be done three consecutive evenings.

To apply the tobacco, one pound of the common tobacco-leaf should be first soaked in six gallons of hot water to which should be added one-half pound of soft black or whale-oil soap. These should be mixed together by the syringe, and the plant should be thoroughly syringed with the liquid in the

evenings and washed by the hose with clear water early the following mornings.

Sometimes it is not desirable to use tobacco in liquid form. In that case the leaves can be dusted freely with tobacco dust which should be left on the foliage for about forty-eight hours, and then washed off with the hose. Should the first application be not effective, a second or even a third application can be made until all the flies are cleared off.

Several prepared mixtures are sold by seedsmen, such as Gishurst's Compound, Fir-tree oil, etc., which, if applied as directed on the labels, will be found effective. Often water used freely with the hose under good pressure will clean them off if applied before the flies have got too strong a hold on the plant.

There are other kinds of Aphides some of which are black and attack Cherry and other fruit trees, but they generally yield to the same treatment.

When the Aphides attack plants in a green-house, fumigation with tobacco stems will be found the best remedy. A close, dull evening should be selected and the foliage of the plants should be perfectly dry.

To effectively fumigate a green-house it is necessary to get an iron pot into which should be put a few pieces of lighted charcoal, on which should be spread a few tobacco stems. On top of the tobacco a layer of damp moss should be placed, and the house should be densely filled with the smoke, care being taken that no flame arises in the burning. The house must be kept perfectly closed for twelve hours. Then the ventilator should be opened and the plants syringed freely with clean, tepid water. Should the first smoking not be effective, the operation can be repeated a second evening, in the same manner, and, when the fly has had a long hold on the plants, it may be necessary to fumigate even a third time.

A pest which is responsible for a great many of our worst failures in plant cultivation is Thrips, as it attacks some of our most delicate and most finely leaved plants, and, from

the fact that this insect is so very small, it is generally not noticed until considerable damage has been done.

It feeds only on the juices and fleshy parts of the leaves, leaving the fibrous parts untouched, this giving the plant a withered, blighted appearance.

This insect may be recognized by its narrow, black or brown body, and its four straight narrow wings which are fringed with hairs in saw-like edges. There are several varieties, but as they are all equally destructive and yield to the same treatment, it is unnecessary to further refer to their identification. When the pest is found to be infesting a greenhouse, the fumigating treatment as recommended for Aphides produces satisfactory results. When the insect is found on shrubs out of doors, the plants should be well syringed with tobacco water, care also being taken to see that the plants are well watered at the roots, this watering giving additional vigor to the plants which will tend to render the Thrips attack harmless.

The Red Spider is a small eight-legged mite which receives its name from its color (always of a rusty red). It has the spider habit of spinning a fine web, generally on the under side of the leaves of trees. It is so small that it is almost invisible to the naked eye.

When Red Spiders establish themselves on a plant, they spin webs of very fine texture on the under side of the leaves. Then by means of their suckers they bore into the leaves and suck out the juice or sap. The leaf becomes yellow and covered with spots, ultimately dies and drops prematurely. Sometimes an attack of this pest strips the tree months before the usual time; if a fruit tree, the crop for the year fails, and besides, the branches formed for the following year are stunted and immature.

The Red Spider seldom attacks plants in a good healthy condition, unless they suffer from drought. Hence any measures which encourage vigorous growth, such as plenty of water at the roots, frequent hosing overhead, mulching the

ground around the plants with manure and freely cultivating the soil, diminish the effects of the attack to a great extent.

When a plant is attacked by Red Spiders, equal parts of sulphur and coal-soot should be mixed and dusted freely over the entire plant, or one pound of sulphur-dust with two pounds of soot should be put into six gallons of water and syringed over the plant attacked. If this pest gets into a green-house, the hot water pipe should be painted with a paste made of sulphur and quicklime in equal parts. If the green-house is heated, the leaves should be dusted with sulphur and soot as recommended for out of door plants, while the atmosphere of the green-house should be kept in a moist condition, and, if these suggestions are followed and careful attention is given to the watering of the roots, the Red Spider will not make much headway.

Caterpillars are of various kinds, some species attacking only Oaks, while others confine their operations to the leaves of the Rose, and still others are found only on the Hawthorn or Cabbage, etc. Those which live in webs, such as the common Oak tree caterpillar, can easily be cut off and destroyed by waiting until evening when they invariably return home after feeding on the Oak leaves all day. The branch on which they have woven their webby home should be cut off, and the caterpillars can then be crushed or piled up and set fire to. In the case of those whose nests are too high to be reached by hand, the branch can be cut with long-handled shears and the caterpillars can be destroyed as just suggested, or, if preferred, an oiled rag can be tied to a long pole and lit, and the web of the nest of caterpillars touched with the lighted rag, their home thus being destroyed and the whole colony killed. No attempt should be made to destroy them in the middle of the day, as they are at that time feeding all over the tree, and any which are overlooked will immediately commence building a new nest, and consequently multiply the number of nests to be destroyed.

The common Rose caterpillar is easily gotten rid of by hand-picking or by dusting with Paris green.

Slugs are about the commonest pest, and these destructive nuisances are well known to all garden owners. They seem partial to soft-wooded plants of low growth, hiding under the leaves which touch the ground, and feeding on the undergrowth and flower stalks, seeming to take delight in eating holes into or pieces out of the leaves and flower-stems, thus ruining many promising flower-beds.

Among the most effective remedies are baits of cabbage and lettuce leaves laid near the plants which need protection. These traps should be set in the evening and examined the next morning; the slugs should be shaken off and covered with lime, salt or wood ashes. All of these applications should be repeated at least once, as the slugs seem to have strength enough to crawl off with one coat of the dust and to throw it off with a coat of slime, but the second application invariably kills them. Frequent dusting of the ground immediately around where the plants are troubled has a great tendency to drive off the slugs. A little dusting of lime close to the neck of favorite plants is also a good cure and a better preventive. A dressing of soot is a very good fertilizer and a good protection against all the varieties of slugs and snails.

The Scale insects are among the most dangerous and troublesome of injurious insects, a single female raising from two hundred to five hundred at a single brood. They are said to hatch four or five generations a year. For the clearing of nursery stock, hydrocyanic acid gas is frequently used by fumigating, but, as it is necessary to have the use of a tent in doing this, it is not always convenient for the amateur, and, unless the operation is very carefully carried out, damage to the plant may result.

A favorite remedy for the common black or brown scale is a strong mixture of tobacco and whale-oil soap, the soap suffocating them by closing the breathing pores along the sides of their bodies. Use about one-quarter pound of the soap and

two ounces of extract of tobacco to a gallon of water and syringe the plants about three times a week, syringing with clear water the day following the application of the mixture; continue the spraying until all of the scale are washed off.

Canary Islands Date-palm.

CHAPTER XX

A FEW EXPLANATIONS AND DIRECTIONS

IN WRITING this book, it has been at times convenient to apply terms commonly in use by professional gardeners.

As the exact significance of some of these may not be known to all readers, it has been thought that the following explanations and directions may be of service.

MULCHING AND TOP DRESSING

As stated in Chapter VI, mulching is the best means of preserving a steady degree of moisture in the soil and of keeping it at an even tempereature. It also prevents the soil from cracking and proves beneficial on account of its substance being washed into the soil by rains or artificial waterings; in fact, there is no practice more beneficial to newly planted trees or plants, of almost any kind, than a good mulching, especially in a climate like ours. It saves much labor in watering, and, as has just been stated, is the best means of preserving a uniform degree of moisture in the soil surrounding the root. This is emphasized by repetition, as it is a most important point, and, other things being equal, plants will languish or thrive just in proportion as this condition is secured.

Although mulching is apparently a very simple operation, it must be carefully done. Before mulching a newly planted tree, the soil should be shaped in the form of a basin, the rim of which is extended one foot beyond the extremity of the roots. The rim should be three or four inches higher than the bottom of the basin so that rain or water applied artificially

will be retained. The mulch should be kept at least three inches away from the stem of the tree.

The best mulch for trees is half-decomposed stable-manure, which should be spread about three inches thick and levelled evenly; about half an inch of soil should be spread over the manure to keep it from shifting in event of heavy wind. Where stable-manure cannot be had, half-rotted tree-leaves, short grass cuttings and even tan-bark are suitable.

The practise of mulching may be carried into the flower-beds, as well as to the trees and shrubs. The writer has personally found the mulching of flowering plants to be of great value. The soil is not compressed by water nor baked into a crust by the sun; evaporation is arrested and the growth materially increased.

In mulching flowering plants the material to be used should be well-rotted stable-manure or thoroughly decomposed leaf-soil and should not be spread more thickly on the surface than one-half inch.

The mulching of lawns should be also very carefully done. Owing to the continuous, heavy, artificial watering necessary in our dry climate, mulching is of great benefit both in preserving the health and vigor of the grass and in preventing evaporation. July is the best month for doing this. After about two months of watering with the hose or sprinkler, the soil will be found to have become hard and washed looking while the small roots of the grass will be partially exposed thus necessarily requiring more frequent and more copious watering. The best mulch for a lawn in this condition is a covering of about one-half inch of well-rotted stable-manure spread evenly over the entire surface of the lawn. This will give a soft springy surface and renewed life and growth to the grass while its color will become much darker. It will not then require nearly so much water to keep fresh and vigorous

Mulching newly sown grass or other seeds means spreading a thin layer of clean, fresh straw over the surface of the ground, its purpose being to shade the ground until the

seeds germinate. The straw should be raked off when the grass is one inch high.

PRICKING OUT

This is a term which is applied to the removal of small seedling plants, from the seed-bed, to pots or boxes. The operation is generally carried out as soon as the young seedlings are about one inch in height. They should be lifted from the seed-bed by hand, the soil shaken carefully from the roots, and the plants placed singly on a thin board or on the surface of the soil in the box in which the young seedlings are to be pricked out. They should then be taken singly by the upper leaves between the finger and thumb of the left hand; a hole should be made in the soil with the forefinger of the right hand or with a dibble and the roots of the young seedling should be carefully placed into that hole so that the lower leaf or leaves of the plant rest on the surface; the soil should then be gently pressed about the roots. When the box or pot is filled, the young plants should receive a gentle watering with the watering-pot through a fine rose. They should then be returned to a position and temperature similar to that in which they were grown, and shaded from strong sunshine for a few days or until the young plants have made fresh roots when they may be gradually exposed to light and air.

BUDDING

The usual method of increasing plants, provided by nature, is by seeds. Seeds increase species, but as the peculiarities of varieties can rarely be perpetuated in the same manner there arose the necessity of finding a method of increasing a variety so that its qualities would not be altered, and this can be accomplished by budding. The possibilities of grafting and budding, however, have certain limitations. Those trees only which are allied to each other respond so that the budding operations can be successfully performed.

As a general rule, the seed, cone, nut and mast-bearing wood should be worked on each other, and unless the stock and scion or bud are nearly related (such as varieties of the same species, species of the same genus, genera of the same order) the result will be unsuccessful.

Budding is an operation by which a bud, together with a portion of the bark, is removed from a plant and inserted beneath the inner bark of another plant or beneath the bark of the same plant. The best time for budding is when the cambium or sap is flowing freely, allowing the bark to be easily raised from the wood. When the stock and the tree or bush, from which the bud is taken, are in that condition, the operation will be successful and the union of the bud with the stock most readily effected. If the bark adheres firmly to the wood, it shows that the flow of sap has been arrested and in that case budding should not be attempted.

In operating, take a shoot from the tree or bush (from which buds are to be worked) and immediately cut off the leaves within one inch of the stem; make a transverse incision in the stock, and, from the middle of this, make a longitudinal one. A bud should now be removed from the shoot by taking the shoot in the left hand and entering the knife about one-half inch below the bud, more or less, according to the size of the shoot and of the stock; with a clean, sloping cut pass the knife upward and inward till under the bud, and then slope outward so that the eye or bud may be nearly in the middle of the piece thus detached. In doing this, the knife will necessarily cut off a portion of the wood along with the bud; this should be removed. To do so, turn the surface upward, holding the piece between the forefinger and thumb of the left hand, enter the point of the knife between the inner bark and upper extremity of the wood, raise the extremity a little, so that it can be taken hold of between the point of the knife and the nail of the thumb, and then by a twitch remove the wood. Be careful to see that, along with the wood, the core of the bud is not also removed. If the

core comes along with the wood the bud is unlikely to be a success, and another bud should be taken.

The bud is now ready for insertion. With the ivory handle of the budding knife, raise the bark of the stock at the incision before mentioned; commencing at the corners immediately below the cross-cut, slip in the handle of the knife gently and carefully avoiding any forcing or scratching of the wood or bark. When the bark is sufficiently raised to admit the bud, take the bud by the leaf stalk and gently insert it by the assistance of the ivory handle. Let the upper part of the bud be at the cross-cut of the stock so that the bud may fit closely to the upper edge of the cut. The operation, to be done well, should be done quickly, for the organizing tissue is very delicate and soon becomes injured by exposure.

The bud, after having been inserted, must be bound by fine matting or worsted, and, in doing this, care must be taken not to move the bud in any way which will cause friction and so injure the tissues below it. In tying, commence below the end of the incision and pass the tie closely round as far as the bud, keeping the bud close to the stock. Continue binding closely until reaching the cross incision; make one or two turns above the cross-cut and fasten the ends of the tie. The operation is now completed.

As soon as it has been ascertained that the bud has taken, the ties should be loosened and retied, to prevent the galling of the bud by the ties becoming too tight.

When the bud has become thoroughly established, which will be known by the bud swelling and beginning to make new growth, the stock must be cut back close to the bud. Should the bud make a strong, soft shoot it may be necessary to support it for a few weeks by tying the shoot to a stake until hard, firm growth is attained.

There are many other modes of budding, but the method described will be found the best for general use.

GRAFTING

Grafting is an operation in which two cut surfaces of the same plant or of different plants are placed so as to unite and grow together. The portion cut off is termed the scion or graft and the plant on which it is worked or grafted is called the stock.

Whip-grafting is generally considered the best kind of grafting and is the one most extensively used.

When the stock and the scion are of equal thickness, the wood of the cut surfaces when placed together, should cover each other completely and exactly, so that the inner bark of the stock touches the inner bark of the scion.

In proceeding to operate, cut the stock in a sloping direction, terminating, if possible, above a bud. Then take the scion and cut it sloping from above and thin towards the end, the shape of the scion being similar to that of the stock; cut a split or tongue a little above the middle of the scion and a like tongue in the cut surface of the stock, the purpose of the tongues being to hold the parts together. The parts should then be secured by being tied with matting or other material and surrounded with grafting-wax, clay or some other substance which will exclude the air and wet.

There are several other modes of grafting including Saddle-grafting, Cleft-grafting and Side-grafting, the object being in all systems to bring together the inner bark so that the sap vessels of the stock will fit exactly with the sap vessels of the scion, and to securely keep them in position until a union is effected.

PROPAGATION BY CUTTINGS

A cutting is an entirely detached portion of a plant, usually a shoot or part of a shoot, having buds or buds and leaves. Cuttings should be taken only from healthy plants and from parts of these which are not in a weakly state, and, further,

only from those portions of the plants which have been exposed to full light and air, for, if the shoots or branches of a plant are not in a condition to make growth with a supply of nourishment from roots of the parent plant, they cannot, when made into cuttings, be expected to possess sufficient energy to produce good plants. A good cutting should possess a certain degree of firmness also, for, if the shoot is exceedingly soft and full of sap, it will not root so freely as one which is more mature.

Cuttings of deciduous trees and shrubs should be taken off after the fall of the leaf and before the rise of the sap in Spring. The buds on the underground part of the cutting should be rubbed off. In making a cutting of a soft-wooded plant, the leaf should be cut off close to the stem on the part which is underground when the cutting is set or planted.

In planting a cutting of a deciduous tree or shrub, it is well to plant two-thirds of the cutting underground, one-third only being allowed to remain above the soil.

When making cuttings, a smooth, thin-bladed, very sharp knife should be used, so that the cut is clean and smooth. A blunt or rough-edged knife leaves a rough, bruised surface which rarely gives good results. When the cuttings have been selected and a sharp knife provided, take each cutting in the left hand, remove three or four of the lower leaves close to the stem and cut through the stem in a slightly slanting direction immediately below a bud or joint. The cutting is then ready to be planted, and should, as soon as possible, be placed in the soil in the position where it is to root.

PROPAGATION BY SUCKERS

Suckers are underground shoots and should be taken up with all their roots attached. They may be taken up at any time when the parent plant or tree may be safely removed.

PROPAGATION BY LAYERING

A Layer is a branch or shoot, part of which is introduced into the soil and strikes root while fed by the parent plant. The operation is effected by simply bending down and burying, about an inch deep in the soil, the branch or shoot to be layered, and preventing it from springing up, by placing over it a hooked peg firmly set in the ground. Before pegging it down, cut a slit in a slanting direction half through the shoot or branch; bend the shoot downward and place it about an inch deep in the ground. Fasten it securely with the hooked peg; then bend the point of the shoot upward until the slit in the shoot is opened enough to allow a very little fine soil to enter the slit. Secure the foot of the shoot by tying it to a stake, care being taken not to sever the layer entirely from the parent plant. Cover the slit portion with some light, sandy soil and give a good watering. In a short time, the layers will emit roots. When the layer has rooted freely, sever the young plant from the parent plant and treat as recommended for young trees or plants.

OFFSETS

Offsets are short, lateral branches or shoots which root where they rest on the soil or under its surface and thus serve for propagation.

NURSERY ROWS

"Plant in nursery rows" is a term frequently used in the foregoing chapters. A "nursery" is a place where trees, shrubs or other plants are raised and grown for transplanting. The young plants are generally set out in lines or rows, hence the phrase "plant in nursery rows."

DIVISION OF THE BULBS, ETC.

"Division of the Bulbs" is simply dividing clusters into single bulbs and planting them singly instead of in clusters.

The same applies to "division of the roots," "division of the crowns," etc.

GARDEN FRAMES

Plant Frames are generally made of redwood boards one and one-half inches thick. Their dimensions vary, a good serviceable size being six feet long by three feet in width of sash. The frame on which the sash rests should be eighteen inches high on the back and eight inches high in front so that the sash, when in position, will have enough slope to shed off the rain.

A Cool or Cold Frame is one which has no artificial heating.

A Hot Frame is one which is placed on a heap of strawy stable-manure or other fermenting material which has partially spent its heat, its temperature having fallen to about eighty degrees Fahrenheit.

Hot-beds are very useful, especially in Spring, for encouraging rapid growth in tender plants or seedlings, as they supply a warm moist atmosphere very congenial to most of the tender plants. Cuttings also of various plants emit roots and grow much faster on a Hot-bed than when placed where there is only fire heat.

To make up a Hot-bed, secure a quantity of fresh stable-manure and an equal quantity of tree-leaves, which have been recently collected; turn them over and mix them together three or four times every second day for eight days. Build the heap the size and shape of the frame to be used, and allow an extra width of two or three feet all around; spread the mixture evenly in layers of not more than six inches each, treading each layer firmly as spread until the bed is built up about four feet high or thick. Over the surface place a layer of ashes, sand, or leaf-mold, well decomposed, spreading it evenly about three inches thick.

The Hot-bed is now ready for the frame, and after the rank steam has escaped, and the temperature of the air in the frame has fallen to eighty-five degrees Fahrenheit, it is ready

Formal Gardening with Grass Walks.

for receiving plants, cuttings or seeds. It is well to allow a little ventilation at the top of the frame night and day for a few days, after new beds are put up.

BOTTOM HEAT

What is meant by Bottom-heat is a bed of sand, ashes or other light plunging material, artificially heated either by hot water or steam pipes, by tanks filled with hot water or by a hot-bed made of fermenting material. In this sand or ash-bed the pots or pans or boxes are "plunged," being buried to the rim. Bottom-heat is considered indispensable for propagating by cuttings or seeds in early Spring.

CHAPTER XXI

SAND RECLAMATION

SAND Reclamation is a matter of considerable interest to those located in the coast counties of California. As the Park Commission of San Francisco has, in the process of construction of Golden Gate Park, overcome the difficulties of sand reclamation, an account of how this has been done and of the work preparatory to the construction of the Park, following the reclamation, is probably the best way to treat the subject of this chapter.

The sand dunes of San Francisco are situated in the extreme westerly portion of the city, and, bordering on the Pacific Ocean, lie entirely open and exposed to the storms of Winter and to the Summer winds which blow nearly every afternoon during the latter season at the rate of twenty or more miles per hour.

This sand is composed of small particles of granite, clean and sharp, without any vegetable matter and having no clay or other soil mixed with it even in the smallest proportion. On account of the almost constant action of the wind, it was formerly kept ever on the move, and in heavy gales drifted like snow, at times being moved in a single day to a depth of three or four feet and often being carried a distance of over a hundred feet.

How to tie this moving mass of sand and to hold and bind it from drifting was the first problem to be solved by the Park builders.

The first experiment tried was sowing barley-seed thickly over the entire area, harrowing and cross-harrowing the sand so as to cover the seed. In due course the seed sprouted and grew to a height of several inches, covering the sand and

Albizzia Julibrissin in Flower.

holding it fairly well for a few months, but, on account of barley being a shallow rooter and an annual, dying out in a few months, it failed to hold the sands together after July, and the winds of August started them moving again.

The next attempt was made with the Yellow Lupine (Lupinus arboreus), a strong-growing, perennial shrub which is a native of this section. The seeds were collected and sown broadcast over a large portion of the area, but this proved successful only in the better protected parts of the district.

The Sea Bent Grass (Ammophila arenaria), a native of the maritime countries of Europe and successfully used in nearly all the coast countries of that continent, was next experimented with. This plant had been used in Denmark, perhaps more than in any other country, but France, Holland, Italy Spain and also Great Britain had reclaimed many thousands of acres by means of this wonderful sand-binder.

The seeds were imported from France, and, first of all, were sown in the nursery. When two years old, the plants were taken up and planted out in the sand-dune district where they immediately took root and, by their tremendous root-growth, held the sands together and prevented them from moving.

The great superiority of the Sea Bent Grass over all others recommended as sand-binders is that it is almost impossible to bury it so deeply in the sand that its crowns cannot push through to the surface. Even if buried many feet deep, it works its strong stems up to the air where new crowns form from which are sent down masses of strong, fleshy roots, anchoring the grass so firmly that the fiercest gales have but little effect on its growth.

This grass is also a wonderful sand collector. Eleven years ago, when the Park Commission of San Francisco constructed the drive facing the ocean along the Great Highway, the line of the proposed roadbed was in many places below high water mark, so sand was scraped from below high water mark in order to raise the roadway to the proper level.

When this was done, the slopes facing the ocean were planted with the Sea Bent Grass which soon took root and grew very strongly, the saline character of the sand evidently being suited to its requirements. In a few months these slopes were one mass of the strong, healthy grass with its thick, creeping, perennial roots anchored deeply in the sand.

The mass of sand is thrown up from the ocean and left on the beach in thousands of tons, and, when dried by the sun, is blown inland by the winds, being carried many miles unless obstructed.

After the construction of the driveway, this sand, when moved by the wind, was caught by the grass planted on the slopes of the newly built road and held there, the grass pushing through the sand as it was piled up, until today there is an embankment formed by this drift-sand which is from ten to fifteen feet higher than the roadway and from a hundred

Eucalyptus in Sand Near Coast.

to three hundred feet in width, firmly kept in position by this wonderful grass.

The culture of the grass is very simple. The roots are dug or pulled up by hand, and, if the ground to be operated on is reasonably level, the surface is plowed with an ordinary plow. A few of the roots are dropped about two feet apart into every third furrow and then covered by the plow, until the entire tract is thus planted. Where the ground is abrupt or too steep for plowing, holes are dug a foot deep and about two feet apart and a few of the roots dropped into each hole, the sand around the roots being pressed firm by the foot. The best season for planting is February or March although the grass will do well if planted either earlier or later in the year, provided the sand is moist. It should, if possible however, be set out during rainy weather, as at such time there is no dry sand to get about the roots; besides, the rain settles the sand around the roots far better than any treading can possibly do.

The sand-shifting having been stopped by the Bent Grass and no further trouble being apprehended from drifting, the next operation in the work of park building to be undertaken by the Park Commission was planting the ground with hardy trees and shrubs.

A great many different species of trees were experimented with, including those especially suggested by European foresters, such as the Norway Maple, Sycamore, Maritime Pine, English Yew, Austrian Pine, the Elder and many others highly recommended. In exposed situations all of these, with the exception of the Maritime Pine, failed entirely.

At the same time, many of our native trees and shrubs, including Monterey Cypress, Monterey Pine, Yellow Pine as well as Alders and Maples were set out. The Cottonwood, Scrub Oak, and other varieties of Oaks, were also given a trial, but, excepting the Monterey Cypress and Monterey Pine, all of them, like the hardier of the European introductions, did fairly well in the sheltered hollows only, where good

soil and plenty of water were provided, while the Monterey Cypress and Monterey Pine alone stood the test of braving the storms and the blasting influence of the Summer winds in the more exposed places and the district close to the shore.

Seeds of a great many trees were also introduced from Australia and New Zealand as well as from South America, and, much to our surprise, some of these gave fine results, the Acacia longifolia and the Leptospermum proving two of the best for this sort of work, these forming a close thicket of twiggy stems which provided perfect shelter for other species not so hardy. Eucalyptus of many species were set out by thousands, but only the common Blue and the rugged Red Gum were a success in the poorer sands, and none of them could stand the climatic conditions unsheltered within five hundred yards of the salt water. The above mentioned and a few other hardy varieties grew fairly well for a period of ten years, but after that time they seemed to become bark-bound and the growth became stunted, showing that the trees, after they begin to form heartwood, require a richer soil than that composed of pure sand.

It therefore became necessary, in order to maintain a healthy vigorous growth in the young forest trees, to supply them with a foreign fertilizer. This was done by utilizing the street sweepings from the down-town streets which were brought out to the Park by electric cars, and, from these cars, distributed by carts and wagons among the starving trees. The change produced by this means was amazing. A few months after the sweepings were spread over the surface, the trees took on fresh growth and appeared to get new life and vigor, the leaves becoming darker and more richly colored.

In addition to the street sweepings, thousands of cubic yards of loam, clay, etc., have been carted into the Park each year for the formation and growth of lawns and shrubbery groups.

When the sand has been bound and prevented from drift-

ing, a forest of strong-growing trees established (giving the required shelter), and a good soil provided, the problem of park building becomes very much the same as when the work is undertaken on a piece of land possessing naturally good soil and covered with natural trees.

On this thousand acre tract, which originally was a bleak waste of drifting, barren sand, may now be found groves of handsome trees, natives of many countries of both hemispheres, and of all the continents. Here one may see the Cedar of Lebanon and of Mount Atlas, as well as the Deodar of the Himalayas, the Araucaria of Chile, Brazil and Norfolk Island, also the large-flowering, handsomely foliaged Magnolia of our Southern States, the Elm of New England, and the Sequoia, Cypress, Pine, etc., of our own State. In addition may be found the Yew of Old England and the fragrant, feathery Acacia of Australia, together with groves of Bamboos, masses of gaily-flowered Camellias and Rhododendrons and stately Rubber trees, while hundreds of other varieties of trees and shrubs are to be seen, natives of many climes, all of them apparently happy and healthy in their new surroundings.

CHAPTER XXII

CALENDAR OF OPERATIONS

IN European countries and the Eastern States of America many works on gardening have been written in calendar form, such a calendar being very convenient for referenec or as a guide for systematic work throughout the year.

Of course, no calendarial directions can be, at the same time, suitable to all the different localities or districts of our great State. It may be pouring rain and cold weather in Humboldt county and on the same day very dry and quite warm in the counties south of Tehachapi; we have cold frosty nights in Shasta county when the oranges are ripening in the county adjoining. While it would be impossible to provide for every contingency, yet, along the coast and in the great valleys, the difference in temperature is not so wide but that a general system of operation might apply to all. The seasons themselves, however, vary so much that many circumstances must be taken into consideration, such as the state of the weather, the condition of the soil, etc. In some years, the Winter rains fall much earlier than in others; one season may have rainfall enough to allow plowing and spading to be commenced early in September, while, in other years, the ground may remain dry and hard until late in November.

Keeping all this in view, there are submitted in this chapter, in the form of a Gardening Calendar, a series of hints and suggestions based on the experience of the writer, which, it is believed, will be found useful and profitable to growers in California, it being left to the good judgment of such to make the necessary modifications when a season has been abnormal

Deciduous Oaks.

or if their locations should happen to be where the temperature goes to an extreme in any way.

JANUARY

If it has not already been done, have all the necessary pruning of fruit trees (including apples, pears, apricots, peaches, plums, etc.) attended to at once; also prune roses and other deciduous trees, climbers and shrubs, removing all decayed or weak growth. If any show signs of ill health, take up the plants and examine their roots; root-prune all unhealthy stock and replant in fresh, well-cultivated deep, rich soil. After pruning, clear away all the clippings and any weeds which may be found either in shrub-groups, flower-beds or walks. Weeds should never be allowed to get foothold in any well-kept garden.

When the hedges have all been clipped and the place has been given a general clean-up, a clear dry day should be selected when the soil is in good condition, neither too dry nor yet so wet that it will stick to the spade; after giving the soil a good coat of at least three inches of old, well-rotted manure, spade the surface of all shrubbery-groups and flower-beds to the depth of at least one foot (except where the operation would interfere too much with the roots of the plants), leaving the soil in as rough and lumpy a condition as possible so as to allow the atmosphere to penetrate the soil.

Plant out all kinds of fruit trees and also all kinds of deciduous trees and shrubs, selecting a day when the air is soft and the soil in good condition, avoiding days when the wind blows cold and dry, or the soil is wet and soggy.

In laying out new rose-beds, first trench the soil to the depth of two feet and mix the soil with, at least, six inches of half-decomposed horse-manure. The soil should be of a good strong nature, not too sandy but not a heavy clay; a good mellow loam of any color, if well-enriched, suits the rose, a fairly well-sheltered sitaution being selected.

January is a good month for laying out new ground, making walks, etc.

In the Greenhouse or glasshouse the principal work is keeping everything as bright and fresh as possible, allowing no dead or dying leaves or dirt of any kind to accumulate on any bench or pot or even under the plant-benches or stages. It is advisable to syringe very little during this month, and only on bright, warm days and in the early morning. It will suffice to dampen the floors and plant-stages (or tables) once or twice a day; especially be careful not to syringe plants which are in bloom, else the display of flowers will be short.

This being the coldest month of the year, and flowers scarce in the open, a good display of color should be aimed at, Roman Hyacinths, Begonias, Cinerarias, Euphorbias, Rondeletias, Primulas, Poinsettias, etc., being utilized. We should keep the greenhouse gay and cheerful during the entire month.

Keep the temperature between fifty-five and sixty-five degrees Fahrenheit at night, allowing a rise of ten degrees in the daytime.

Give larger pots to pot-bound palms or other evergreen, ornamental-leaved plants which have healthy roots. Examine each individual plant, and, if the roots are not in a healthy condition, cut back the diseased roots to healthy tissue and repot the plant in a pot of the same size or even in a smaller one, using good, fresh soil composed of two thirds turfy loam and one-third leaf-mold with enough sand to keep the whole open and free, together with a sprinkling of bone-meal or crushed bones.

Sow seeds of Lobelia, Pyrethrum, Celosia, Wigandia, and other bedding foliage-plants, placing them in sandy leaf-mold and giving them partial shade until germination.

FEBRUARY

The old adage "as the day lengthens the cold strengthens" is just as true in California as it is in the East, and should be carefully remembered by all who grow, in the flower-garden, plants which are at all tender. Cinerarias, for instance, may be carried over a few cold nights by being covered with light cotton sheeting and will thus give grand results in the early Spring, whereas, if not protected during cold nights, they will be a failure. The old favorite Spring-flowering Doronicum should now receive special attention and will be found useful in beds and borders. Plants which have been transplanted in the Fall or have been left undisturbed from the previous season will give good results in the Spring, while those whose roots are divided at this season, will flower late in the summer, thus giving a longer season of flower.

Ivy growing on walls should be trimmed in, fairly close to the wall or fence, as it quickly becomes covered with new leaves at this season. Rough walls have an attractive look if covered with Ivy, Virginia Creeper or Boston Ivy. Ivy is also useful for planting under trees where grass and other plants die out, or for rambling over rocks, tree stumps or rooteries.

In the flower-borders, the Iris reticulata and Iris major are, during this month, developing their deliciously fragrant flowers and deserve a little extra attention in the way of the ground being kept clear of weeds, of being mulched with well-decomposed manure, and, should the season be inclined to be dry, of being given a copious supply of water at the roots. The same instructions should be followed in the treatment of Hyacinths, Tulips, Anemones, Ranunculus, Daffodils and other Spring-flowering bulbs.

Seeds of numerous species of annuals will have to be sown during the next few weeks. The hardy kinds may be sown in the open ground in sunny, sheltered situations, in well-prepared soil when the weather is fine and the soil is in a fairly

dry condition. Salpiglossis, Phlox Drummondii and Zinnia, also Aster, Petunia, etc., should be sown, about this date, on a mild hotbed which has an even covering of finely-sifted soil two inches deep, thoroughly moistened before the seed is planted. The seeds should be thinly sown in rows and covered with finely-sifted soil to the depth of one-quarter of an inch; shade the soil until germination has taken place, care being taken that the young seedlings are not allowed to flag or wilt or even to become dry. When the seedlings are large enough to be pricked off, they should be planted, three inches apart, in moderately rich soil in boxes (four inches deep) or singly in two and one-half inch pots.

Insert cuttings of Alternanthera, Iresine, Heliotrope, Petunia, etc., in pots or boxes filled with a mixture of one-half finely-sifted leaf-mold, one-quarter loam and one-quarter clean white sand, with a half-inch layer of sand on the surface; give water enough to settle the sand about the cuttings and plunge in a bottom heat of about seventy-five degrees Fahrenheit in greenhouse or hot frame, keeping them in a close atmosphere and shaded from sunshine for about ten days and then gradually exposing them to light and air. Seedling Lobelia and Pyrethrum, sown last month should now be pricked out about two inches apart in light rich soil in pans or boxes. Place them in a close, warm atmosphere shading them until they re-root in their new soil when they may be gradually inured to air and light.

Dahlias. If an increase of the number of plants is desired, old roots should now be put upon a bed having a mild bottom-heat, the tubers being covered up to the collar with light leaf-mold, or other light sandy soil. Syringe them twice daily, and as soon as the young shoots have made two or three joints in length, slip them off and place them singly in small pots filled with sand and leaf-mold, half and half, well-mixed together; then plunge them in a close, warm frame or greenhouse and, when they are rooted, gradually expose them to air and light.

Hollyhock seeds should be sown early in the month in order to get good flowering plants the first season. East Lothian Stocks, Lobelia cardinalis, Verbena, Celosia and also Pentstemon and Antirrhinum should be sown early in this month. Begonia tubers, lifted in the Fall, should now be placed in boxes, on a thin layer of light soil and half-covered with the same kind of soil. Start them growing under cool treatment and keep them in a cool frame until planting-out time. The stock of plants may be increased by dividing tubers which show many buds. The cut surfaces of these divisions should be sprinkled with sulphur-dust and allowed to dry before potting.

Where flowers of Sweet Peas are desired early, seeds should be sown, in the first week of this month (in well-prepared, rich garden soil) about three-quarters of an inch deep, either in rows or in small circles. As soon as the young plants are about four inches high they should be given a trellis or other light support to climb over.

Sow also in the open ground, as early in the month as the soil is in the proper condition, that is when the soil is moist but not too wet or sticky, Eschscholtzia, Lupine, Poppy, Corn-flower, Nemophila and other hardy wildflowers and annuals.

GREENHOUSE

If the repotting of the general collection of plants recommended last month is not finished, that work should be attended to as early this month as possible. As the days lengthen, more ventilation should be given, the ventilators being closed early in the afternoon and the temperature allowed to reach eighty-five or ninety degrees Fahrenheit by sunheat. Should greenfly, scale or other insects have appeared, boil one pound of whale-oil soap in one gallon of rain water (or larger quantities in the same proportion) and use one-half pint of this mixture in four gallons of rain water for syringing

twice weekly; if mealy-bug is troublesome, add eight ounces of petroleum. When it is necessary to use the petroleum mixture, it should be done about five or six o'clock in the evening on dull days only. By using this petroleum emulsion occasionally, much labor will be saved in checking the spread of mealy-bug and the leaves will become glossy.

Ferns growing freely should be afforded abundance of moisture at the roots, and a moist atmosphere must be maintained at all times, this being, for successful fern culture, an absolute necessity. Lygodium scandens, a climbing fern suitable for covering walls, trellises, etc., requires frequent attention at this season. In order to display the plant effectively, each frond should be secured to a fine wire; the plants should be given abundance of water at the roots and syringed frequently. Where it is desirable to increase the number of plants, in the fern family, divide the old plants into sections, and pot them in suitable sizes, care being taken that the plants are put into the smallest sizes of pots in which they may be comfortably placed, in soil composed of one-third mellow loam, one-third leaf-mold, and one-third peat with enough sand to keep the whole open for free passage of water. Place them in a shaded portion of the greenhouse, syringing morning and evening, keeping the temperature at sixty degrees Fahrenheit at night, allowing it to rise to seventy-five degrees Fahrenheit by day, and carefully preventing cold draughts of air from passing through the house.

Hanging baskets should now receive a thorough overhauling. If a basket requires replanting, line it first with moss and place about one inch of soil over this; place the plants in the basket and fill the basket with lumpy, fibrous loam and a little peat. Asparagus Sprengeri and Asparagus plumosus are excellent plants for growing in baskets as are also the Davallia ferns, the Boston fern and many of the Adiantums. Many of the small-flowering tuberous Begonias also make excellent subjects, especially where hung above the eye when their lovely flowers show to good advantage.

Terraced Front. Camphor-trees on Sidewalk.

Propagate by cuttings, Coleus, Pilea muscosa, Tradescantia, Ficus and Panicum; also propagate Begonia Rex from leaves and Isolepis by division.

Caladiums and Alocacias, having rested during the Winter, may now be repotted. Shake the old soil from the tubers and pot them in small pots, allowing not more than a half-inch of soil between the tubers and the side of the pot. They should be placed in soil consisting of equal parts of fibrous loam, leaf-soil and peat, with enough silver-sand to keep the whole sweet and open. After potting, place them in a mild bottom heat of about seventy degrees Fahrenheit and a top temperature of about sixty degrees Fahrenheit at night, allowing a rise of about ten degrees in the daytime; water sparingly until growth has begun. When the plants have filled the pots with roots, change them to larger pots, taking care that an inch of fresh soil surrounds the ball of earth around the plants; this will necessitate a pot two sizes or inches wider than the one the plant formerly occupied. In repotting, use the same soil as recommended for the first potting, but, in addition, mix a little very old well-rotted half-dry cow- or horse-manure with it as the Caladiums, like most other large-leaved, rapid-growing plants, love good rich feeding and plenty of water during the growing season.

Gloxinia, Achimenes and Tydæa may also be started and treated in much the same way as recommended for the Caladiums; see that the pots are well supplied with drainage material by filling the pots at least one-quarter of their depth with crocks or broken bricks, placing one flat piece over the hole in the bottom of the pot and, above that, small pieces not over half an inch thick; cover this with moss to keep the soil from washing into the drainage material.

Rearrange the plants from time to time as this will tend to keep them in better condition and more shapely in appearance; wash the pots, sponge the leaves, etc.; also wash the woodwork and give a general cleanup to the house; in short, neatness should be in evidence in the greenhouse.

MARCH

If wet weather or any other cause has rendered it impossible to carry out the directions given for last month, these should now be proceeded with. This is the best month for planting Eucalyptus, Acacia and other semi-tender trees and shrubs, as directed under their respective headings. All vacant ground should be manured and spaded where required; weeds should be destroyed wherever found, and the ground stirred lightly with the hoe or rake in order to destroy nests of slugs and harmful insects. Ground which was roughly spaded last month should now be hoed and raked when moderately dry. The borders of the shrubbery and other ground, where flowers are to be planted or where seeds are to be sown, should be worked over, levelled and raked preparatory to planting and seeding.

If they have not been already sown, plant seeds of Sweet Peas, Nemophila and the other annuals recommended last month, sowing them in circular patches in small groups, or in beds or rows where plenty of space is available. Plant out young plants of Carnation, Phlox, Violet, Pentstemon, Campanula, Columbine, Japanese Anemone and other hardy, perennial flowering-plants in well-prepared, fairly-rich soil. Plant out also Gladiolus and other hardy bulbous roots (including Begonia and Caladium esculentum), mulching among the plants with a light sprinkling of well-rotted manure.

This month is the most favorable for giving the Rockery a little overhauling in the way of arranging such plants as Sedum and Mesembryanthemum. The especially strong-growing varieties will generally be found to have outgrown the space allowed them and should be dug out and replaced by small plants or cuttings, cuttings generally being preferred as it takes only a few weeks for them to root and to begin to bloom again. Crassula, Cactus, Echeveria, Aloe,

Auricula, etc., should be examined, and, where necessary, should receive a top dressing of rich light soil to encourage fresh growth; those having tall flower-stems should be neatly staked in order to support their heavy flower-heads in stormy weather. Arabis, Saxifraga and other Spring-flowering rock-plants should have the ground about them examined and the surface top-dressed, and, as soon as the blooming season is over, their flower-stems cut off, while, when necessary, the plants should be severely cut back to encourage fresh, vigorous flowering-growth for the following season.

When space is available, sow varieties of wildflowers. In any out of the way spot not used for any special purpose, have the ground spaded and sown with seeds of the different strong-growing species such as Lupinus bicolor, Collinsia bicolor, Eschscholtzia, etc., also Shirley and Iceland Poppies, Foxglove, the common sweet Mignonette, and Nasturtium both climbing and dwarf, not forgetting the free-spreading sweet Alyssum as it will continue flowering late in the Autumn when most of the others are past.

GREENHOUSE AND FRAMES

Alternanthera, Iresine and all bedding plants should receive their final transplanting preparatory to hardening off. The small-growing dwarf species, such as Alternanthera, are better grown in boxes (the dimensions of which should be about fifteen inches in width, twenty-two inches in length and four inches in depth) and should be planted in light rich soil about two inches apart. Boxes of this size are also used in growing Aster, Stocks, Verbena, Petunia and most of the low-growing annuals. Dahlia, Hollyhock and all strong, tall-growing, flowering and ornamental plants do better if grown singly in pots.

Sow, early in the month, seeds of Stocks, Aster, Coreopsis, Dianthus, Cosmos, Ipomœa, Marigold, Phlox Drummondii, etc., and, for succession, Lobelia, Zinnia, and Gaillardia.

Continue the work recommended for last month in the greenhouse, keeping up a warm, moist atmosphere to encourage vigorous growth. As the flowering-plants, such as Azalea, go out of bloom, pick off all the seed-pods and place the plants in a warm, moist atmosphere to induce them to make fresh growth, shading them during hot sunshine. Plants in need of repotting should be attended to as soon as they are fairly started into growth, using good, fibrous peat, leaf-mold, a little broken charcoal and coarse silver-sand for the potting. Work the soil firmly and evenly round the old ball with a thin rammer, making it as firm as that of the old ball. Syringe the plants freely with soft water while they are making their growth; as growth progresses give them more air, and, when completed, place them in the open air in a cool shaded situation (avoiding cold draughts) and plunge the pots in ashes to about half their depth.

Caladium plants which were started as advised a few weeks ago will now be ready for repotting in pots two sizes larger than those they occupy. The soil should be composed of one-third loam, one-third leaf-mold and one-third silver-sand with a sprinkling of pulverized cow-manure mixed with the soil. To encourage vigorous root action, warm humid air should be provided; close the ventilators early in the afternoon and conserve the sun-heat; syringe the plants freely with soft tepid water and shade them during the bright sunshine.

Repot Coleus, Begonia, etc., as their pots become filled with roots.

The majority of green-house plants may be propagated during this month. As a general rule, those cuttings root most readily which are taken from plants that have formed half-ripe wood. In the case of Begonia or other soft-wooded plants, cuttings may be taken from any portion of the young shoots, provided a clean cut is made immediately below a joint and with a sharp knife.

Lawn and Driveway.

APRIL

Nymphæa, Lotus or other water plants should be planted or replanted early in April before the young leaves have made much growth.

If the water cannot be run off the pond, it is a good plan to fill, with loam and old manure in equal proportions, the required number of wicker-baskets (boxes made of laths will answer for the same purpose), plant in each basket a few good crowns, covering the surface with an inch of coarse sand or fine gravel, and then sink them in the desired positions in the water. For strong-growing varieties, such as the Nymphæa Marliacea, Nymphæa alba, Nymphæa chromatella, Nymphæa tuberosa and also the Lotus family, larger bodies of soil are required in order to have them at their best.

In the case of ponds where the water can be run off, mounds of soil, held together by being surrounded with big round stones, should be made, the plants set out and the pond quickly filled.

It should be remembered that a large number of crowns on a plant is not conducive to free-flowering.

In addition to the Lilies themselves, attention should be given to the many beautiful plants which thrive in shallow water or on the banks bordering a pond, either partially submerged or in the adjacent moist soil. For partially submerged spots or shallow water the plume-like Papyrus antiquorum and the Cyperus or Umbrella plant, the Calla lily and all of the Rushes and Water-grasses are recommended, while the Pontederia cordata, the Sagittarias and the Aponogetons all add to the attractiveness of the pond or water-garden. Where occasional flowering takes place, many handsome plants may be grown, any of which can be planted now. These should include the gorgeous Japanese Iris, the Spiræa Aruncus, many of the Bamboos, Funkias, etc.

A number of the bedding plants such as Fuchsias, Ger-

aniums, the earlier Lobelias, Pyrethrums, etc., should now be placed out of doors in sheltered situations, and all other bedding plants, as soon as they are the required size, should be gradually hardened off, care being taken not to expose them suddenly from hot green-house or hot frame to the open air. It is advisable to keep them under glass for a week or ten days with the ventilators open both by day and by night, and, for the first few days after being placed out of doors, they should be shaded during bright sunshine by being covered with some light cheese-cloth or similar light shading.

If not already done, Cannas and Phloxes should have their roots taken up and the crowns divided into bunches (two or three stems to each bunch) and planted at once in well-enriched, loamy soil; plant the Cannas about three feet apart and the Phloxes about eighteen inches apart.

If the stock of Dahlias is short, cuttings may still be taken. Pot the cuttings singly in two-inch pots and plunge them into a little bottom heat where they will soon take root. These late stock cuttings make excellent late-flowering effects, continuing well into November. Shrubs which have been transplanted during the last few months should be closely examined, and, if the weather be inclined to the dry side, given a good soaking of water at the roots; then they should be well mulched with old manure. Spray them with water late in the afternoon of dry days to encourage the swelling of buds and the making of fresh growth.

Roses will now be making good growth, and the busd should be thinned according to the strength of the variety. Keep the soil open by stirring it with the hoe, especially after rain or after watering artificially, as this prevents undue evaporation. Should the green fly attack the leaves, spray them with the mixture of whale-oil soap and tobacco-juice in the evening, and hose off the plants the following morning with clear water. Should one application not be effective, spray again the following evening, using the hose again next morning to wash off the soap. Even a third similar applica-

tion may sometimes be necessary. Some use quassia-extract in place of the whale-oil soap with the tobacco, and apply it in similar way. One of the worst enemies of the Rose is the Rose-leaf Roller, for which sprayer should also be used. In addition to this, examine the plants daily and squeeze the grubs between the finger and thumb. Should mildew appear, apply flowers of sulphur. The best time to do this is in the early morning while the dew is on the leaves.

GREENHOUSE

Indian Azaleas which have finished blooming, should, as recommended last month, have their seed-pods removed and, if necessary, be given larger pots. This is a good time to put in cuttings of the Autumn favorite Chrysanthemums. Select strong, short-jointed, young wood. Insert the cuttings in sandy leaf-mold and place them in a cold frame, shading them for a few days during sunshine and giving them a slight sprinkling with the watering-pot in the evening before closing the sashes. As soon as the young plants are well rooted, pot them singly in two-inch pots using soil composed of two parts turfy-loam, one part sandy leaf-mold and one part old, well-decomposed horse-manure, with a little bone-meal. Be careful that all the ingredients are well-mixed together and see that proper drainage is afforded. Pot the plants firmly and return the plants to the cold frame; keep them close for a few days and syringe them lightly overhead at least once a day. Should the green fly appear, dip the heads of the plants in softsoap and water.

Begonia Gloire de Lorraine and other fibrous-rooted Begonias will now require attention. Having washed clean a sufficient number of thumb-pots and attended to the drainage, fill each pot loosely with sandy leaf-soil to the rim; make a hole in the middle, insert a cutting and fill the hole with silver-sand, making the soil firm about the cutting; plunge them in a place where they will get a little bottom heat, say

about eighty degrees Fahrenheit, standing them closely together. Each cutting being struck singly in a pot, it is not necessary to disturb the roots at next potting.

Sow seeds of Primula sinensis in well-drained, shallow pans filled with soil composed of light loam, leaf-mold and silver-sand mixed in equal parts and sifted through a sieve with a half-inch mesh. Having made the soil firm and level, sow the seeds evenly and press them into the soil with a piece of smooth dry wood; cover the seeds lightly with fine particles of sandy leaf-mold; water with a fine rose and cover the pans with a piece of glass on which place a thin layer of moss. Keep the moss damp until the seeds germinate; place the plants in a temperature of about sixty degrees Fahrenheit; shade them during the sunshine and see that the soil does not become dry. Gradually inure the young plants to light and air, and, when they make four leaves, transplant them into shallow pans, an inch or two apart, using the same soil as recommended for the seed.

It is now also the time of year to put in cuttings of Coleus, Acalypha and other soft-wooded plants. See that the young plants of this class are not allowed to get pot-bound. Acalyphas especially should be given plenty of pot-room as they require good cultivation.

In potting young plants use rich loam, half-decayed leaf-soil and sand, with a good sprinkling of old manure and a little bone-meal; keep the foliage clean by sponging the leaves, as overhead watering is liable to cause the racemes to decay; grow the plants in a warm, moist atmosphere.

MAY

Sow seeds of Cow-slips and hardy Primroses early in the month, either in a cool, shady border or in boxes in a cold frame where they should be kept shaded from sunshine until germination. Seedlings, well-grown, generally give better re-

Hedge Front, Clipped Trees and Palms.

sults than those propagated by division of the roots. As soon as the young plants are large enough to be handled, prick them out in a shady, well-sheltered border in a light soil, giving them plenty of water; plant them in their permanent quarters in September or October where they will give fine effects during the following Spring.

Annuals, the seeds of which were sown some weeks ago in the flower-border and other vacant spaces, should now receive attention in the way of thinning, in order that they may not become crowded. Before thinning, give the ground a good soaking with water so that the roots may be the more easily drawn from the soil. Should there be any danger of loss from slugs or other insects, it would be safer to defer the final thinning until the young plants are at least three inches high. It is well however to err on the side of excessive thinning, as crowded annuals always look poor and insignificant and bloom for only a short time. After thinning, mulch lightly with old manure about half an inch deep.

A further sowing of any subject which will come into flower late in the Autumn is now in order. This might include Sweet Peas, Poppies, Corn-flowers, etc.

Border Carnations should have their flower-stems tied loosely to neat stakes painted brown or green, and the soil of the beds should be hoed after each watering, never being allowed to crack or become baked.

Bedding-out of all the tenderer species such as Alternanthera, Coleus, Cock's comb, Iresine, etc., should be finished this month, cloudy days or the later hours of the afternoon or evening being selected for the work.

Should the planting of the hardier subjects, such as Pentstemon, Antirrhinum, Gaillardia, Dahlia, Lobelia cardinalis, etc., have been delayed, they must be planted out as early this month as possible; select favorable weather, avoiding cold days or days on which the wind is strong or the sun very hot. Plant them in the evening and give them a thorough watering immediately. It is necessary to give the soil

a good watering a few hours before starting to plant, and on no account plant out young bedding stock when the soil is at all dry even if it be so only on the surface.

GREENHOUSE

Begonias, started some weeks ago, will now require larger pots; allow two sizes larger where the plants are in vigorous growth; pot in soil composed of loam, leaf-mold and sharp sand, with a sprinkling of bone-meal or old cow-manure mixed through it for the tuberous section; for the fibrous division of the family, add a little peat to the mixture.

Give additional pot-room, as required, to all soft-wooded or fine-foliaged plants; also tie, prune or stake as required to keep the plants in good shape.

Prick off seedlings of Primula sinensis, Cineraria and Calceolaria in pans or small boxes, planting them in soil composed of leaf-mold and silver-sand with a little fibrous-loam added. Place the plants in a close frame and shade them during the hot sunshine, avoiding cold draughts of dry air.

The tubers of the handsome, Winter-blooming Gesnera should now be started. Place five or six tubers in a six-inch pot, in soil composed of two-thirds fibrous loam and one-third peat, with a little leaf-mold and sand to keep the soil open. Cover the tubers to the depth of half an inch; place them in the warmest corner of the greenhouse and give them water as required at the roots but avoid sprinkling the leaves as that will spot them.

JUNE

Neatness and cleanliness should always be evident in the flower-borders, spent flowers, faded leaves and weeds being removed at least once a week and the surface of the soil stirred frequently with the push-hoe or hand-fork.

Continue to stake and neatly tie in Carnations and all plants requiring support, doing this before the stems begin to fall or bend over. Vacant spaces, rendered so by the passing of the late-Spring flowers, may be planted after being fertilized and spaded, Dahlias, Salvias, Chrysanthemums, etc., being utilized for late-Fall flowering.

Dahlias, of course, all require stakes which should be set before the work of planting proceeds, and the shoots ought to be fastened loosely to the stakes so that they may not be broken by the wind.

Roses should have all spent flowers removed, partly for appearance's sake and partly as a relief to the plants. After the first crop of flowers is past, sprinkle a little bone-meal or other artificial fertilizer around the plants and stir the surface of the soil, leaving it a little rough so that when water is applied, which should be done immediately, the water will wash the fertilizer rootward. A few hours later, or as soon as the soil will work freely, dress the surface neatly with the rake.

Climbing roses, especially the strong-growing, free-flowering varieties, should have the young shoots secured to the wires or the trellises. If their roots are in soil which is light and dry, abundance of water should be given immediately followed by a light mulching.

Attend at this time of the year to the regulating and thinning of climbing plants generally; where they are crowded, thin them out, and, where plants have not filled their allotted space, some shoots should be laid in for the purpose.

GREENHOUSE

Chrysanthemums should now be in condition to be transplanted into their flowering pots, the exact date for potting being however of not so much importance as the condition and quantity of roots in the pot. Unless the roots show a net-

work around the ball, repotting should be deferred until this condition prevails. When giving them their final potting, use soil composed of any good, strong, turfy-loam mixed freely with old horse-manure and a little sand. As Chrysanthemums require a large amount of water, the drainage of the pots should be ample and carefully placed so as to prevent water-logging. After potting, place them thickly together on a cindered or ash-covered surface in a sheltered position, out of doors.

The dryness of the air at this season will necessitate the constant damping of the paths and stages of the greenhouse. Open all ventilators early in the morning, closing them again early in the evening; syringe ferns and all smooth-leaved and ornamental-leaved plants not showing flower, with tepid water, but carefully avoid syringing with cold water or water with a temperature lower than the air of the greenhouse at the time of syringing. Plants, showing flower-trusses should occasionally receive weak manure-water or a top-dressing of some artificial manure.

Sow seeds of Calceolaria, for succession, in shallow pots or pans, carefully drained and containing soil (consisting of loam, leaf-mold and silver-sand in equal parts) which has been passed through a half-inch meshed sieve. The soil should be pressed firm and watered a few hours before putting in the seeds which should be sown evenly. Barely cover the seeds with a light sprinkling of silver-sand; place them in a cold frame or hand glass, facing the North; keep them closely shaded until they germinate when air may be admitted gradually; sprinkle them overhead morning and evening.

Put in cuttings of Coleus for the Winter decorations and repot Cineraria, Begonia, and other soft-wooded plants as required.

Formal Approach with Italian Cypress

JULY

Gladioli are now much benefited by a dressing of old stable-manure, followed by copious applications of water. When nourished in this manner, the plants will grow to a large size and give fine spikes of large, deep-colored flowers.

Dahlias also should receive plenty of water, and, when in heavy bloom, they will be greatly benefited by a generous supply of liquid manure twice a week; no plant repays generous treatment and good cultivation better than the Dahlia. Thin out weak shoots and attend to the staking and tying in of the shoots; also thin the flower-buds and cut off all spent flowers.

Early-flowering varieties of Chrysanthemums should now be making rapid growth. If weak shoots appear they should be removed at once; see that they are well attended to in the way of watering and repotting, for if the plants are allowed to suffer from lack of pot-room or of sufficient moisture, the result will be weak stems and small flowers. Attend to the staking and tying of the plants in order to guard against injury from strong winds.

Deciduous shrubs, such as Weigela, Deutzia, Mock Orange, etc., should have the shoots, which have flowered this season, cut back to the stronger young shoots, and all weak shoots removed entirely. Care should be taken that they receive plenty of water at the root during the growing season.

Seeds of Mignonette may now be sown, selecting if possible a cool situation facing the North. After sowing, shade the soil with some light material, such as a thin layer of straw to keep the soil from baking until germination. Sow also seeds of Pansies, Hollyhocks, Canterbury Bells, Intermediate Stocks, Wallflowers, Anemone coronaria, Carnations and other early Spring-flowering plants. By sowing seeds this month, one can count on having strong plants ready to take

the place of those which finish blooming in October, and the plants which begin to show bloom in early Winter will keep the flower-beds bright with color until late in the Spring.

Put in the last of the Poinsettia cuttings for the year as early in the month as practicable, care being taken that the young plants do not suffer from want of water, as few plants show the effects of the lack of it more quickly than the Poinsettia. As it is generally desired that the largest plants possible be grown in small pots, a rich soil should be used in potting. A compost consisting of good turfy-loam, good peat or leaf-mold, and silver-sand, with a sprinkling of bone-meal will be found suitable. In potting, the size of the future pot should be borne in mind as really fine plants may be grown in six- or seven-inch pots; so, in the first potting, three-and-a-half-inch pots will be found large enough. When the cuttings are first potted, return them to the cutting bed and keep them shaded closely for a few days, syringing with tepid water several times daily until they form fresh roots when they can be gradually exposed to the sunlight. This treatment will cause the leaves to be retained almost down to the soil. In the Southern portions of our State, where this plant gives such splendid results in the open air, the young plants may be set out in their permanent quarters about the beginning of the present month, a sunny, sheltered situation and a fairly-rich, light soil being selected.

Transfer seedling Cinerarias and Primulas to three-inch or four-inch pots, selecting soil of equal parts loam and leaf-mold with a little sand for the potting material.

Palms should now be in full growth. They should be copiously syringed night and morning and have weak manure-water applied to the roots at least once a week. Should any scale or other insects appear, give a thorough cleansing with soap-suds or other insecticide (using a sponge or soft rag when washing), going over the leaves two or even three times until they are perfectly clean.

At this dry season, Ferns should be given a plentiful

supply of water; the air of the house should be maintained as cool and moist as possible by keeping the floors and benches constantly wet. Keep the plants shaded at least eight hours of the day.

Continue to propagate Acalypha and Coleus for Fall and Winter decoration.

AUGUST

Cuttings of any favorite variety of Roses may now be put in; select, for this purpose, half-ripe wood or short-jointed wood which has perfected its flowers. The cuttings should be taken off with a heel or cut just below a joint. Pieces of stems about four inches in length will be found sufficiently long for cuttings. Insert them in a shady, sheltered corner in sandy soil and let them remain there until growth commences, or, better still, insert them singly in small pots in a glass frame and plunge the pots in cool ashes, shading them for a few hours in the middle of the day. They should occasionally be sprinkled overhead with water and the frame should be kept moderately close. Frequent attention must be given in order to maintain the flower-garden in good and attractive condition; all spent blossoms should be removed.

All annuals whose flowering season is over should be taken up, the soil manured and the spaces planted with late-flowering plants. Attend closely to the cultivation and irrigation of all Autumn-flowering plants, such as Dahlias, Cannas, Chrysanthemums, etc., giving copious supplies of water at the roots and also giving manure-water as required; stir the soil frequently and rake off all weeds.

Keep the ground about Violets well-cultivated and watered, removing all side shoots and runners. A light mulch of half-rotted manure will benefit them greatly during this season.

Begonias, both the fibrous-rooted and also the bulbous sections will now be in bloom. Be careful that they do not

suffer from want of water at the roots and also overhead, for they should be sprinkled from above in the evening. A mulching of very old cow-manure will be found beneficial and will greatly assist in prolonging their season of bloom.

Sow seeds of Anemone coronaria, mixing the seeds with fine sand before sowing; when the seedlings are two inches high, set them out in rows in a shady, cool, sheltered situation.

Also put in seeds of Silene pendula and Forget-me-not for early-Spring flowering. These too should have a cool, sheltered spot, being transplanted a few inches apart when ready; plant them out, where it is desired that they flower, early in November.

Rocheas, as they are now classed, are very showy subjects, especially the scarlet-flowered species (Rochea coccinea) which blooms so freely all through July, August and September. When it is desired to increase the stock of these, cuttings should be inserted. They should be placed in three-inch or four-inch pots filled with sand and old lime-mortar or broken brick, mixed with a little loam. They should occupy a cool position facing the North where they will be found to readily take root. This free-flowering succulent should be seen more commonly as it grows and blooms freely with little care and requires no artificial irrigation.

GREENHOUSE

The Alocacia and other ornamental foliaged plants should be examined from time to time for red spider, Begonia mite and other insect pests. Should any of these appear, the leaves should be sponged with some insecticide. It should be borne in mind that only the injury caused by the mite and not the mite itself is visible to the naked eye.

Streptocarpus. Keep all plants near the glass affording them shade in the middle of the day, and syringing them daily, morning and evening. When necessary, change them

into larger pots, potting them in a compost of loam, leaf-mold and dry cow-manure taken from an open pasture. Good drainage should be afforded and they should be kept in a temperature of seventy degrees Fahrenheit by night and in a moist atmosphere until showing flower, when they should be allowed a dry atmosphere.

Chrysanthemum. Be on the watch for black aphides and green fly, and if any are discovered dust the leaves with tobacco-powder in the early morning when the foliage is damp.

Make all growths secure by staking each stem to light stakes so as to prevent swaying by the wind. If the pots are full of roots, give light dressing of manure about the roots, or water with liquid-manure about twice a week.

SEPTEMBER

Trees and shrubs which show signs of flagging should receive attention and be given water at the roots otherwise they may be greatly injured, especially if the weather should continue hot as it often does during the greater part of this month.

Spanish and German Iris, having ripened their bulbs, may now be taken up. The ground in which they are to be replanted should be dug deeply and well-fertilized with old rotted manure. The bulbs should be set out early in November; in the meantime have them sorted and placed in boxes in a cool dry place.

Propagate cuttings of all bedding plants as early in the month as practicable so that they may be well established before wet weather and dark days arrive.

Tuberous-rooted Begonias should now be at their best; encourage them to prolong their flowering season by giving them copious waterings and by giving the beds a light mulch of some suitable material such as very old stable-manure or leaf-mold.

Beds of Asters and other annuals which have ceased to

bloom should be cleared of all old plants; if it is intended to fill the beds for Winter and Spring flowering, have the ground spaded over and apply a good dressing of soot. If the beds were manured in Spring, no manure will now be required. Plant the beds with Wallflower, Myosotis, Silene, Pansies, Aubrietia, Viola cornuta, etc., planting them as soon as convenient so that they may get well-established before cold weather sets in. If planted early, they should begin blooming early in December and give abundance of flower all through the Winter and early Spring.

GREENHOUSE

Poinsettias should be fully exposed to the sunshine from the present time on in order to mature and firm the growth.

Let the last batch of rooted plants be placed in their flowering-pots, which need not be larger than six-inch and the smaller plants will do better if given four-inch pots.

Roman Hyacinths, Paper white and Double Narcissus. Pot about five bulbs in a six-inch pot filled with a good rich compost, and plunge the pot in ashes for a few weeks, covering the pot with sand or ashes to the depth of six inches, leaving it thus until the bulbs fill the pot with their young roots. A situation facing North is most suitable for the plunging bed. When the pots are filled with roots, they may be brought into the greenhouse and gradually exposed to the light. Pot successive lots of bulbs so as to maintain a continuous supply of flowers from early in November until February when they begin blooming out of doors.

Large-flowering Hyacinths. As soon as the bulbs arrive, have them unpacked at once and placed in a cool place until they can be potted. The most important point in Hyacinth growing is in the preparation of the soil which should be composed of good yellow loam, old dry cow-manure rubbed through a half-inch sieve, some coarse leaf-mold, and enough sand to keep it open. This compost should be well-mixed

Summer House. Standard Roses on Border of Path.

together by being turned over several times, and should be left to mellow at least one month before being used. For single bulbs of Hyacinths,use a pot having a diameter of five inches. Crock the pot by placing one flat piece of crock over the hole in the bottom of the pot; over this place two inches of potsherds broken into small pieces, and, to keep the soil from choking the drainage, above these place a thin layer of moss; then fill the pot loosely with the soil, making a hole with the hand for the reception of the bulb and placing a handful of sand in the cavity; on this place the bulb; press down the bulb and soil together and make the soil firm with the fingers, leaving the crown of the bulb a little above the soil. Give a good watering and place out of doors on a bed of ashes on a site with a Northern exposure and cover to the depth of six inches as previously advised for Roman Hyacinths. Here they should remain for about six weeks when they should be examined, and, when the pots are well-filled with roots, they may be removed to a cool place in the greenhouse and gradually exposed to light and air or to warmer quarters if desired to flower early.

Hyacinths, to flower in glasses, should be solely of the single-flowering varieties, and only good-sized firm bulbs should be selected. Nearly fill the glasses with soft water (rain water preferred); in the water place a few small pieces of charcoal; place the bulbs in the glasses so that the bases barely touch the water and place the glasses in a cool, dark situation until the roots nearly fill the glasses, when they may be placed in the greenhouse and gradually exposed to light but free from cold draughts. When it is desirable to transfer, to glasses, Hyacinths which have been grown in pots, their roots may be freed from soil by carefully dipping the ball in water and washing the roots, after which they may be placed in the Hyacinth glasses. A fresh batch of bulbs should be potted at intervals of three weeks until November, after which the bulbs seem to deteriorate.

When desired, Tulips, Scillas, Crocuses, etc., may be

grown. The soil and treatment recommended for Hyacinths will be suitable for them also.

OCTOBER

Pinks and Carnations. Cuttings and layers which were put in in July should now be well-rooted and ready to be planted in their permanent quarters. Examine the soil, and, if it looks the least sour or sticky, have it dug and left rough, giving it no water for at least two weeks; this treatment will greatly assist in sweetening the soil. After the soil has been well dried and aired, give it a good watering and again turn it over with the spade; level it, and, after raking it, mark the ground and plant the young plants, setting them out about eight inches apart. Do not allow the roots to become at all dry before they are planted. After planting, give a good watering with the watering-pot to settle the soil about the roots, afterwards giving a light sprinkle to the leaves. A light spraying every evening for a week after planting will greatly benefit the young plants.

Dahlias should still afford a good show of flowers. See that they are all correctly labeled before the blooming season is over; remove all spent flowers and decaying leaves, and give copious supplies of light liquid-manure during dry weather.

Chrysanthemums will now be showing bloom. Give them also a generous supply of water at their roots and apply liquid-manure once a week. When large flowers are desired, thin out the flower-buds to one bud to each stalk, and see that the stems are well-secured by being tied to light stakes to prevent them being blown about by the Autumn winds.

Fibrous-rooted Begonias, which have been occupying space in the flower-garden during the Summer, may now, if thought desirable, be taken up, potted and taken to the greenhouse where they will continue to flower most of the Winter. It is well to shade the plants for a week or ten days. after placing them indoors, until they form new roots.

Anemones may be planted during the present month; plant them six inches apart. One-half inch of soil should cover the crowns, and any good friable garden soil grows them well.

Plant Cow-slips, hardy Primroses, Cinerarias, Pansies and other early Spring-flowering plants in their permanent quarters.

GREENHOUSE

Cineraria. The more forward plants should now be put into three-inch pots in a compost of loam, two-thirds leaf-soil and one-third dry cow-manure from an open pasture, with a little sand and a sprinkling of bone-meal added. Let them stand on a bed of ashes in a protected spot facing North

Calceolaria. Pot off the young plants of Calceolarias in two-inch pots and treat as recommended for Cinerarias.

Primula. The early plants will soon begin to show their flower-spikes. If the pots are full of roots, give them a little weak liquid-manure occasionally. Later plants, now in three-inch pots, should be transferred to others, five inches in diameter, if they are already well-rooted. This treatment will be suitable for not only Primula sinensis but also Primula stellata (a type which should be more commonly seen) and Primula obconica; if well done, this will enable them to continue in bloom throughout the Winter.

Caladium. Where the more delicate varieties are grown, great care should be given them at this season. Many tubers are lost every year by being dried too rapidly. As soon as the leaves show signs of dying off, the plants should be placed in a position where they may receive the full light and be watered carefully; reduce the quantity of water as the foliage decays, and discontinue it altogether when the foliage is all dry. When the tubers are ripe, allow the soil in the pots to become perfectly dry. The pots may be laid on their sides under the plant-stage or in any dry place where the temper-

ature does not fall below fifty degrees Fahrenheit; they may remain there until wanted in early Spring.

Ferns, which have been growing in a close and moist atmosphere, should now be allowed more light and air, as soon as their growth is completed, in order to harden their fronds, as in this condition they are better prepared to withstand the cloudy days which may be expected during the next three months.

NOVEMBER

Keep the lawn well-rolled and smoothly cut, removing all fallen leaves. These can be much more easily swept up when the grass is smooth and short than when it is otherwise. The walks should be kept well rolled and their edgings neatly cut. When walks, edgings and lawns are neatly kept, the garden always looks well even though flowers and color may be scarce.

Examine Lily bulbs carefully as soon as their leaves have fallen and their stems are dead, to see if they are attacked by wire-worms. Should cut, wire or other worms be found at work in the bulbs, take the bulbs up at once and dip them in water strongly diluted with soot, and, as soon as the bulbs have been cleared of the pest, plant them, in a different part of the garden, in fresh soil in which no worms or other vermin are to be found. The soil should be rich and soft with no rocks or hard clay in its composition. Plant so that the top of the bulb will be two or three inches under the soil.

Tuberous Begonias, which have ceased to grow or flower, should have their stems cleared of all decaying leaves, and their tubers lifted and shaken clear of soil; place them in boxes half-filled with sandy leaf-mold, and store in a cool dry place where they may be kept until required for replanting in the Spring.

Dahlias also, as soon as their tops are ripe and their flowering ceases, should have their stems cut down to within a foot of the ground and their roots lifted and freed from all

soil. After attaching labels to each, place them in a cool, dry shed for a few weeks and then store them away for the Winter.

Montbretias, where they have got matted too thickly, should be taken up and the best bulbs selected and replanted in other quarters, or, if in the same ground, after the soil has been dug over two feet deep and enriched by a heavy layer of manure well-mixed through the soil.

Other hardy bulbs, such as Iris Kæmpferi, and Iris germanica as well as the Spanish and English varieties, should be closely examined, and, if the bulbs are at all crowded, taken up. Have the ground spaded and enriched by a heavy coating of manure and then replant the plants. Most of the Iris prefer a moist situation and a rich soil.

Lobelia cardinalis. Cut down old flower-stems and divide the crowns; replant them, where they are desired to bloom, in good rich loam. This same treatment may be given the herbaceous plants such as perennial Phlox, Doronicum, Delphinium, Kniphofia, etc. Vacant spaces may still be planted with Tulips, Hyacinths, Daffodils and other Spring-flowering bulbs, planting as recommended in a former month.

Myosotis should be planted freely in any dry bank as soon as the rains have sufficiently moistened the soil.

Primroses and Cow-slips (if this has not already been done) should have the crowns divided and replanted singly about six inches apart after the soil has been cultivated and enriched.

Canterbury Bells may be set out in suitably prepared spots. These plants look exceedingly well in clumps or groups. Plant them about eighteen inches apart and not too deep.

When it is desirable to plant evergreen shrubs or trees, November is one of the best months for doing the work. Camellia, Rhododendron, Magnolia, Laurel, Pittosporum and other hardy evergreens move well at this season. See that the soil is in good condition, neither too wet so that it becomes sticky with working, nor so dry that it does not break softly.

It should be moist, without being wet or soggy, so that it will rest kindly among the fine fibrous roots. Working the soil among the roots with the fingers is still the best way to manage this very important part of transplanting either flowering plants or shrubs.

GREENHOUSE

Palms and other smooth-leaved evergreens, such as Croton, Maranta, Cycas, etc., which may be infested with scale, should be carefully sponged and cleaned, using a little soap and plenty of clean tepid water. Keep Cyclamen plants near the roof-glass. Should any of the plants require repotting, pot them in a compost of three parts good friable loam and one part leaf-mold with enough silver-sand to keep the soil free and open. Should the foliage be attacked by Mites, which will be shown first by the rusty appearance of the foliage, dip the leaves in a strong solution of tobacco-water, two or three times, at intervals of two days. Keep at a temperature of about fifty degrees Fahrenheit.

Calceolaria. In order to have healthy, strong plants, careful attention must be paid to their roots; repotting at the proper time is very essential. Should the operation be delayed too long the plants become stunted and rarely recover from the neglect. They should be moved just as soon as the roots have well-occupied the soil. Keep the plants in a cool half-shaded position away from fire-heat and dry air While giving them plenty of ventilation, no cold draughts should be allowed to reach their foliage. Should green fly attack the leaves, fumigate at once, and, if necessary, two evenings in succession, until all trace of the aphides disappears.

Group of Varieties of Palms.

DECEMBER

When Lawns or grass edges have become uneven or in bad condition or partially worn, this will be found a good month to relay the sod. Low spots should have the sod raised. This is done by taking up the sod and leveling up with good rich soil, then relaying the sod and afterwards rolling or tamping it with the back of the spade until the whole is level and even.

Where grass edgings are worn, the sod should be taken up (being cut in squares of about one foot) and placed on the opposite side of the walk. After giving the ground a good coating of old manure, spade to the depth of twelve inches, breaking up the soil as fine as possible with the spade. Level and rake the ground into shape and relay the sod, putting each square into place as neatly as possible. Give a light sprinkling of sifted soil and a good soaking of water; the following day, tamp level with the back of the spade, making the whole solid and hard. After edging into line it should look as well as an old established lawn.

Where new grounds are to be laid out and much planting to be done, December is one of the best months for the carrying forward of this work, also for the planting of most of our hardy trees and shrubs.

Plant deciduous trees and shrubs, also Cypress, Pine, Laurel, Euonymus, Box and all hardy evergreens, leaving Eucalyptus, Pittosporum and most of the Australian groups until March.

The pruning of Roses should be attended to this month; cut out, first, all weak or sickly growths and cut back all unripe soft shoots to firm, mature wood.

Climbers should have their shoots thinned out where they are at all matted; cut out all hard, weak wood which does not produce strong, young shoots. After pruning, tie all straggling shoots into place, and mulch with good manure about the roots of all Roses whether grown as standards, on

trellises or in beds, leaving the mulching to be washed in by the Winter rains. Plant Roses in ground well trenched and manured.

GREENHOUSE

Begonia Gloire de Lorraine. Propagate this plant by means of the leaves; remove the leaves, with a sharp knife, close down to the base of the leaf-stems, and place them in shallow pans filled with clean sharp sand or light sandy leaf-mold, selecting strong leaves for cuttings.

Climbers should be freed from superfluous shoots, all growths too weak to produce flowers being removed and the strong shoots shortened.

If any scale or other insects be found among the leaves or stems, the plants should be taken from the trellises and thoroughly cleaned.

See that Poinsettias and other flowering-plants are carefully watered at the roots and their flowers and bracts kept away from drip and damp.

Keep all paths clean and give air freely during warm weather, opening the ventilators in the early part of the day and shutting them up again as soon as the temperature begins to fall in the afternoon. See that the foliage of all plants is kept clean and free from insects.

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ERRATA.

Page 33. No. 74—for "japonicus aureus" read "Euonymus japonicus aureus".

Page 79. First line—for "Hornbean" read "Hornbeam".

Page 103. Sixteenth line—for "thel" read "the".

Page 163. Thirteenth line—for "Cpress" read "Cypress".

Page 171. Illustration—for "Pyracantha angustifolia" read "Cratægus Pyracantha angustifolia".